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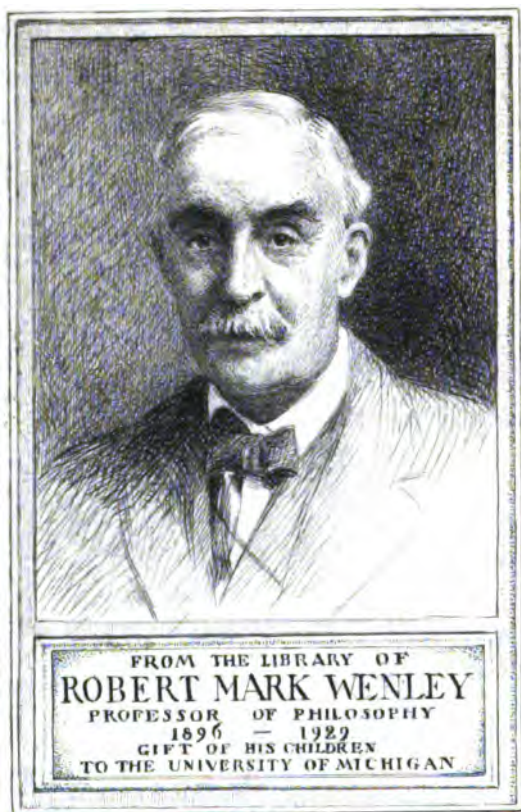
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An Unorthodox Conception of Being

A Synthetic Philosophy of Ontology

By

William Ellsworth Hermance



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PREFACE

THE first draft of this work was written in the latter part of the nineteenth century. During the decade or more since its inception a wider reading has revealed to the author that, although the ideas herein expressed are independent, they, with few exceptions, have already been expressed by others. This might be taken as demonstrating that "There is nothing new under the sun," but this is true only in part. There certainly are new *forms*. Not only new *forms* in the arrangement of the material, but also new *forms* of the expression of ideas. Although each idea embraced in the composition of a conception might be old, yet a different combination of these ideas would give a philosophy of existence differing in many respects from any philosophy heretofore given and possibly more nearly in accord with the actual facts of Being.

We grant that the ordinary material elements are not new; that they have been known for centuries, and have existed from infinity; yet combinations of these elements are constantly being made, giving us compounds that in all probability have not before existed on this earth.

The developer of a new chemical combination or the inventor of a new mechanical arrangement is a practical benefactor, giving forth material facts that can be easily understood and appreciated, but the formulator of

ideas, the philosopher, the theorist, the metaphysician is accounted nothing more than a dreamer, for whom the ordinary, practical man has but contempt. This is a superficial view to take, for metaphysics has the same relation to physics that the foundation has to the building, and although the foundation may be hidden and obscure, primarily on the correct laying of the foundation depends the durability of the building. Making this illustration logical, we must conclude that in the history of man, physics came first, for the first building had no foundation. The ideas of existence conceived by primeval man were no doubt as crude as their mud huts and as devoid of foundation. The material existed at that time for the modern skyscraper, but the form as a building did not exist. The same natural processes existed at that time as at present, but the ideas of them in their proper relation, or as laws, did not then exist in the human mind.

Aristotle, Copernicus, Galileo, Bacon, Newton, Darwin, and a host of such minds perceived ideas nearer to the reality of existence, and knowledge was increased in the world, but these ideas were essentially metaphysical. Not one of these men acquired fame by originating a new material combination or form, but each became famous because he perceived ideas of existence which men now accept as being more nearly in accord with the facts of Being than the ideas men previously held.

Thousands of years ago men were born, lived, and died after the same manner as they do now. Millions are now living who know not, neither do they care, whether the earth rotates or "the Sun do move"; whether things fall because they are heavy or are heavy because they fall; whether their weight depends on the

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square of the distance or inversely upon the cube of the distance; whether the universe was made in six days or was ever made at all; and to come to the point, these millions live their days as full of contentment as you or I. Why, then, do we take the trouble to elucidate an idea? Because you and I believe that material existence is not all that is necessary for man's development; that the aspiration and the inspiration of the mental and spiritual are what makes him more than an animal. Also as Heine says:

We do not take possession of our ideas, but are possessed
by them.

They master us and force us into the arena,
Where, like gladiators, we must fight for them.

As one author excellently expresses it:

The inward life of thinking for one's self, the within or behind tradition constitutes the very Spirit of Truth himself in our own spirit, and the coming of the spirit, in so far as it occurs at all, never seems to any of us dreary.

As for the fine drawn distinctions and airy abstractions, no distinction is ever too subtile for you at the moment when it occurs to you to make that distinction for yourself, and not merely to hear that somebody else has made it, and no abstraction seems too airy in the hour when you rise upon your own wings to the region where just that abstraction happens to be an element in the concrete fulfilment of your thoughtful life.

Now it chances to be a truth of metaphysics, as it is an experience of religion, that just when you are most individual, most alone as it were in your personal thinking about ultimate and divine matters, you are most completely at one with the universal Spirit of Truth, of which we just spoke. Hence, not the character of the principle of which we think, but rather our own sluggishness in thinking is

responsible for the supposed dreariness of the theory of Being. The dreariness which we often impart to metaphysics is merely the dreariness of not understanding the subject. A sort of dreariness for which indeed there is no help, except learning to understand.

The mental and spiritual development of man increases in a direct ratio, as he perceives ideas which are in accord with the facts and truth of Being and Existence.

Philosophical ideas are, of course, expressed only as theories or hypotheses. The theory which more nearly accords with all known facts should be the acceptable theory. The hypothesis most easily workable should be the one chosen. Experience will eventually prove the truth or falsity of any theory or hypothesis.

But not wishing to wait upon experience, and without adequate material measures to test philosophical ideas, it might be suggested that to be correct ideas must be absolutely logical and absolutely consistent. It may be some time before we reach the absolute, but it is obvious that the nearer we approach the standard, the nearer we are to a correct knowledge of the true relation of the various aspects of Being.

Did we not believe that the ideas as herein combined are a nearer approach to the truth, there would be no excuse for their being published. Should the author appear dogmatic or prove to be incorrect in any particular, he wishes it understood that he realizes and wishes to be guided by the fact that the fundamental principle of scholarship is loyalty to truth, wheresoever it leads and whatsoever it involves.

Some common nouns used as specific terms are capitalized. By so doing it is not the intention always

to deify their meaning but to emphasize the word in the connection used.

Power and Force, Desire and Fear are no more when capitalized than when not, but these words are used with such a distinctive meaning that it is necessary to use some method of holding the attention to these distinctions. It is necessary to use certain terms with a distinctive meaning in order to be logical and consistent and give a definite philosophy.

A dictionary is the chief authority for our definition of words, but when the lexicographers disagree, who shall decide? When any dictionary gives several definitions of a word, the most that can reasonably be asked is that the writer take any one of the definitions and consistently use the word according to that definition.

The specific object of the author in writing this book is to give expression to his ideas regarding man's existence and environment. It is a conception of Being not exactly orthodox according to any of the general beliefs, therefore, he calls the conception Unorthodox.

He thinks that if he points out to some extent a few of the so-called facts and the fallacies of the modern physics and metaphysics before giving his own ideas, the contrast will give additional weight to the opinion herein expressed.

In criticising the opinions or conceptions of others, their right to have and believe those opinions is not challenged. Perfect liberty in the reception and expression of thought is essential to the best mental and spiritual development.

W. E. H.

NORFOLK, VA.

June, 1912.

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An Unorthodox Conception of Being



An Unorthodox Conception of Being:

A Synthetic Philosophy of Ontology

CHAPTER I

METAPHYSICS

THE different conceptions of Being, now orthodox, may be classified under four general hypotheses:

I. **IDEALISM.** That objective Being is wholly visionary—an illusion; that it is no more real substance than a dream. This Idealistic view has been held by many from the followers of Buddha to the Christian Scientist.

II. **MATERIALISM.** That Being is solely material; the matter taking shape mechanically, according to an absolute law; that all change is infallibly linked as cause and effect. This Materialistic view is held as pure science.

III. **DUALISM.** That Being was created and given form by a Power exterior to and separable from the matter of which the forms are composed. "In the beginning God created the heaven and the earth." This orthodox, Theistic view has been and probably is yet held by the great majority of the people.

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IV. MONISM. That Being is the manifestation of power; that primarily the forms are the effect of the spontaneous movement of forces inherent in the material. This Positivistic view is held by probably an ever-increasing number of people.

Any two persons classified under any one of the hypotheses might differ more widely in their specific beliefs than two people classified under different headings. In fact, the more nearly persons are in accord in their fundamental beliefs, the more strongly will they magnify their differences, and frequently they are at greater enmity than those who radically differ. It is well known that factional quarrels are the most bitter. As widely different as these four general hypotheses may appear, I am under the impression that the wide difference we give to the interpretation of similar words cause the beliefs based upon them to appear more diverse than they really are. "Define terms, and discussion ceases" might be true if it were possible to define terms.

Consistency has been mentioned as a vital point in philosophy, but so rare is this that it has given rise to the saying, "Consistency, thou art a jewel." My idea of consistency is not to get in a rut and consistently remain there. It is to recognize the proper relation of things and to relate things properly, no matter how diverse they may seem. To hold to one point of view is narrow-minded. To get at the viewpoint of others is broad-minded.

You may recall the legend of the Knights and the Shield, where the contestants fought on account of their difference in opinion, and in the end each found that the other was right. One of the most common statements, "I am right, and therefore, you who differ with me are wrong," generally contains a fallacy.

To illustrate: You have seen those signs which appear different at different angles of observation. "A" was standing in front of one of these signs and read, "Man is but grass"; "B," on his right, read, "Man is an animal"; "C," on his left, read, "Man is a God." Each asserted that he read the sign aright, and therefore, the other must be wrong in his reading. Each was right in his first proposition, but wrong in the second. "A" doubted his infallibility and put himself in "B's" place and perceived that both were right and wrong. "A" wanted "B" to look at it from "A's" former position, but "B" said that to do so would be to show a doubt, which he was not willing to do. When "C" heard "A's" statement, he also doubted his own infallibility, and moved around and found that the sign was far more complex than he at first supposed, and, continuing to investigate, came to the conclusion that the sign itself was contradictory. "A" continued the investigation, and, while admitting that the sign was apparently not absolutely consistent in its statement, yet thought if they could comprehend the meaning of each statement, they would ultimately find out that each was true.

You may readily recognize in this illustration the various positions taken by different persons on any question. It is evident that "A" and "C" by doubting their infallibility are willing to change positions, and are more apt to gain new knowledge and have a better chance of reaching ultimate truth than "B," who dogmatically asserts that *he* is right and the others are wrong.

It is evident that to an investigator no statement is authoritative. A premise based on a mere statement is fallible.

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When it was the general opinion that the earth was flat, premises were based on that idea. There was no demonstration made to show that it was flat; it was taken for granted. When some minds recognized facts that did not correspond with the idea of a flat earth, they sought for a theory that would correspond with the recognized facts. When the theory was stated that the earth was round, the premise was then taken by those who opposed the theory, that "I am standing with my head up, and if the earth is round and people are on the opposite side, they must be standing with their heads hanging down, a position plainly impossible, therefore, contradicting the theory." This argument at one time was unanswerable, for the facts were not yet recognized that made it known that up and down were positions, relative not to each of us but to a common centre. No matter how strongly we find ourselves entrenched in the propositions of our premises, a newly-recognized truth may show that we are mistaken. To me this chronic state of doubt does not necessarily show incapacity, but may designate a willingness to advance to new positions, grasping the truth recognized in fact, for to know the truth is essential to knowledge. Every fact must be a part of the truth, and to ignore it is to fall that far short of perfection.

It seems quite natural that in the search for knowledge fallacies should be more numerous than facts, but it is necessary to recognize the fallacies in order to know the facts.

The first step in advancement is to doubt. This seems contrary to the general idea, which puts faith as the essential to salvation; but let us take man on any plane of intelligence, and if he has perfect confidence that his knowledge and beliefs are correct, there will

be no change. If he is wrong in any way, he can know it only by recognizing his fallibility, and to do that is to doubt his infallibility; thus, to doubt is the first step toward a broader intelligence. This would not be necessary if man were correct in his conception from the beginning, but experience shows that he is not.

It is not necessary to doubt to the extent of an Agnostic, that is, to "know nothing." It is much better to say with Cicero, "I will never be ashamed to confess that I know not that which I do not know," than to say with Socrates, "The one thing I know, is this, that I know nothing."

One must discriminate between infallible facts and fallible beliefs. There can be no rule laid down by which we can correctly discriminate, any more than one can be given to make all think alike; but the more knowledge we get, the more facts we recognize as a common basis for our varied ideas. Though we deduce various theories from the same facts, yet, as we approach the truth, we get nearer together in our conclusions, and finally, man may be of one mind on essentials and can co-operate on any work for which he exists.

The submission to authoritative opinion is one thing that has kept people from progressing more rapidly towards a universal conception of Being. Aristotle was authority for many minds, and when young Galileo pointed out his errors in regard to the velocity of falling bodies, and even proved his point so none ought to deny, yet so strong was the respect for authority, that on account of his presumption Galileo was forced to vacate his position as professor in the University of Pisa. The critic now meets with about the same reception as in the days of Galileo. People dislike to change their minds or remodel their theories. In science they are

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often forced to do so, but a metaphysical or religious theory generally runs its course, long or short, according to whether or not it forms a reasonable working hypothesis.

If, in a proposition of Newton's, a school child detects and proves a mathematical or logical error, is n't he of equal authority on the point of issue? It is much easier to detect errors than it is to evolve an acceptable theory. Theories, to be accepted as facts, should satisfactorily account for all phenomena in connection with the events which they endeavor to explain. One of the common errors is teaching theories or beliefs as facts. This is seen not only in religious teachings, but in scientific text-books.

Many words are used by scientists to denote theoretical conditions, and these words are copied by some metaphysical writers to designate known states; it is as though they used "X" to designate a definite, known condition because they have seen it frequently used, but yet without knowing that it means "Unknown." Until in the evolution of man, thought-transference shall become a practical way of communication, we will have to depend on language for an interchange of ideas. If language is God-given and perfect, then man's perception of its meaning is imperfect, for certain it is that we do not thoroughly comprehend the speech of our fellow men.

It has been said, "Language was given to conceal thought," but for whatever purpose it was given, it is very frequently used to conceal the *lack* of thought.

To know that one is logical and consistent, the language must be definite. Wherein lies the cause of vagueness? When we read a book or an article and fail to comprehend just what the writer means, it may be

our lack of comprehension or the weakness of language, but I believe it is frequently because the writer himself does not comprehend, or at least fails to comprehend, his idea in its proper relation to other ideas or facts. Instead of describing facts of reality as he supposes, he is describing imaginary conditions, which, though they may be facts of consciousness, are not facts that can be demonstrated to others. Though this is a common failing of all classes, it is a typical fault of the Idealist, which would naturally arise from a belief that demonstrable facts do not exist.

In Materialism or pure science there are used to a large extent symbols and technical language, which admit of so little chance of misinterpretation that science has a reputation for accuracy, which by comparison seems to be absolute. But a close analysis will demonstrate that even science is far from absolute accuracy.

In the concrete we have a ready means of reference, while in the abstract, once lost, we do not know whether it is ourself or the other who is astray. My little child said at the table, "Please, give me a bot boll." "I don't know what you mean," said I. She immediately pointed to a hot roll and I instantly understood. Had it been an abstraction, it would have taken some time to have reached an understanding.

Some words have various definitions or interpretations, and much ambiguity comes from using the same word in the same connection, but with a different meaning. Such words as Spirit, Soul, Life, and Mind are so much used, or rather misused, that they have no definite meaning. To express ideas accurately we must use our words with a more strictly definite meaning.

There is a common misuse of the word "Cause." In the ordinary usage it does not make much difference,

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but in philosophical works it is the source of many illogical conclusions. Every phenomenon has two aspects: the *Space* aspect and the *Time* aspect. "Cause" corresponds to the *Space* aspect and usually answers the question, "*How?*" "Occasion" corresponds to the *Time* aspect and usually answers the question, "*Why?*" That is, it gives the specific reason for the initiation of a specific movement. I will give two illustrations:

1. How are the tides caused? By attraction. Why are there specific movements or variations in the tides? Because¹ the attracting bodies are periodically changing their relation. This periodicity being a time relation "occasions" the high and low tides.

2. What caused the explosion of the charge of the gun? One might say "a signal," "an action of a finger," "a movement of the trigger," "the falling of the hammer." Let us take these given causes (?) in turn. A signal could not cause an action of a finger although it might occasion the action. The action of the finger might cause the movement of the trigger, but the movement of the trigger is inadequate to cause the falling of the hammer. The movement of the trigger occasioned the movement of a spring whose action caused the fall of the hammer. The fall of the hammer is not sufficient to account for the result following the explosion. But without defining each intermediate step we might say it "occasioned a change in the relation of the forces in the powder, which change is manifest as the explosion." The only adequate cause of the explosion is the forces changing relation, that is, a relative change in the form of motion. The so-called causes previously given are only successive occasions

¹ "Because" is equally applicable to "for the reason" as to "by the cause."

for various actions which terminated in the explosion. If you asked why the powder exploded, meaning at that time, it is pertinent to say, the given signal—the action of the finger—the movement of the trigger—or the falling of the hammer. But if you ask how the powder exploded, we readily see that these answers are not sufficient and that what occasions the phenomenon is not the cause of the phenomenon.

It is impossible to do the best work with a poor tool. Language becomes a *good* tool for expressing ideas in the proportion to which it is made definite.

Primarily, language, as well as ideas, is vague. The evolution is from the vague to the definite. The less intellectual the person, the more easily is he satisfied with illogical theories. The masses of people are not only satisfied with illogical theories, but they do not even realize that their ideas are illogical. Any apparent contradictions in their conception of Being are taken for granted as a proof of the finiteness of man.

Early philosophers were and still are considered great, *not because they are definite*, but because they grasped new ideas of the relation of Being. Compared to the crude ideas or lack of ideas then commonly existing, the various philosophers expressed ideas that were comparatively rational, and in fact many that were not so definite as to be capable of being proved false, are still current. Diogenes is famous for his tub and lantern, but he was one of the first to put forth ideas of "Soul," "Principle of Life," "Vital Force," etc., words of absolutely no definite meaning, because they are subject to various interpretations.

There is one society, whose alleged millions of members accept "Vital Force" as quite a concrete thing, and start with the proposition that to know the secret

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of "Vital Force" would be to obtain perpetual life. They then say the thing that gives vitality is "Glame" and by obeying the laws of nature and continuing to breathe as they direct, life will be prolonged, say, two hundred years, though that is not really given as a limit. If one dies before that time, he has disobeyed the laws of nature or ceased to breathe as they direct, and, of course, under such circumstances they cannot be held accountable. The use of the word "Glame" simply mystifies. Until we know the cause of life, how can we know the cause of vitality, which is simply the prolongation of life? And how can we obey the laws of nature until we know them, and to know the laws of nature is to know the truth, *i. e.*, to have knowledge.

The effort to describe one abstraction by the use of another is futile. The effort to show that one abstraction is the cause of another is useless, because it is incapable of any reasonable proof. I suppose it is so constantly used because to an equal extent it is as incapable of disproof. The tendency of modern thought is to eliminate all unnecessary and extraneous abstractions.

An early theory regarding the existence of the earth was that it was held up by an elephant, which in turn rested on the back of a turtle. The first and second unknown causes seemed to satisfy the philosophers of that day, and even now there are many philosophers who have at least two abstractions, one behind the other, primary and secondary unknown causes. Did I find it necessary to resort to a cause so remote, I would not leave it so quickly. I would say, "The earth rested on an elephant, and the elephant stood on a turtle, and the turtle sat on a log, and the log floated on the water, which in its depths became attenuate

into the ethereal ether that forms the astral body of the universe"; and that description would be as concise and definite as are many of the descriptions of the mystic-scientific writers of the day. But would such a description come any nearer to relating the earth properly to the other facts of Being?

Idealism, from its very nature, gives rise to more vagueness than any other conception. Idealistic conceptions are amenable to no rules or regulations. Although the ideas are wonderfully diverse, they are usually expressed by positive statements. Their assumptions are based on hypothetical ideas and their conclusions may or may not conform to the facts of Being. If not, so much the worse for the facts. From the standpoint of a human being many of the assumptions seem to be misstated. "All is God"; "God is perfect"; "Then all that has real existence must be perfect"; therefore, "We who are not perfect do not exist." The correct form of the statement should begin with the speaker, "We do not exist," and this is a negation. These propositions are a sample of the Idealistic philosophy and while incapable of proof, they cannot be refuted. It is simply a question of belief.

The very fact that abstractions are so mobile has caused the philosophies of the Idealists to be the most complete, comprehensive theory of existence from a purely abstract conception. "Karma," "Nirvana," and such words express and embrace more abstract ideas than we can do with words in our language. Unadulterated Idealism has been perfected by the Orientals as a working hypothesis to a degree of consistency that the Anglo-Saxon race can never expect to attain. That a large portion of the human race is

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not satisfied that this is the true conception of Being is sufficient reason for the dissatisfied turning to some other hypothesis.

By the very nature of our conception of ideas, they are first Idealistic. When ideas are properly formulated they are ideal. When we get our ideas or an idea properly related to the facts of Being it ceases to be an ideal, and becomes real.

Materialism has been established on a solid basis and has become the storehouse for our facts and there we have accumulated a great fund of knowledge. But the acquisition of this knowledge is due not nearly so much to one fact leading to the discovery of another fact (arguing from the known to the unknown), as it is on account of the Idealistic theories conceived by the Scientists, but being Materialists instead of Idealists, they put forth their effort to demonstrate their theories by mechanics and mathematics instead of being satisfied with an abstract elucidation of the ideas. In the history of scientific acquisitions we find that exploded theories and discarded hypotheses form quite a large ratio to those which are now accepted.

Simply the cognition of sense impression does not constitute knowledge. A recognition of these impressions singly would not aid, as our senses constantly deceive us. It is the relation of sense impressions; the realization that they are persistent under certain circumstances; the summing up of these impressions under the head of experience and properly relating them, that constitutes knowledge. We do not know that the mental states are real, any more than we know that the causes of sense impressions are real. A mental state or a sense impression by itself has no real meaning. It is only by relating it to something else that it can

have meaning. On account of this, intelligent people doubt the statement of events called supernatural and miraculous. They believe that all events are related by cause and effect.

It is not an easy thing to differentiate what we know from what we believe. There may be inconsistencies in what we believe, but there should be no contradiction in what we know. It is a prime requisite of belief in vague theories that the believer shall be blind to the inconsistencies. When one sees the inconsistencies, it is to admit of a doubt of the truth of the belief. Many evade this by claiming that the inconsistencies are only apparent, owing to the inability of the mind of the believer to correlate the apparent inconsistencies, and not in the statement or philosophy of the belief.

Unless we can arrive at some agreement as to what is an absolute truth, it is plainly impossible for us to arrive at any common conclusion. An absolute truth in statement and idea is essential for a base. We may draw different inferences from this truth, but to make a conflicting statement would invalidate the argument and the agreement. I say that the shortest distance between two points is a straight line. "B" admits it but says also that the shortest distance between two points is a curved line. I say the two statements are inconsistent. "B" says they are only apparently inconsistent, because we have not developed sufficiently yet to comprehend the truth of both statements. I cannot prove this is not so, for it is impossible to define the limits of human development, but under such circumstances, I cannot come to an agreement with "B." As I have said before, it is, therefore, essential that we have some fundamental truths admitted in order to

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come to an agreement, and that these truths once admitted be not controverted or contradicted or even evaded.

We must accept as an axiom of our philosophy the statement that "Human knowledge exists." This statement may be denied but not disproved. To deny it is to deny any sure basis of agreement and leave no ground for argument. To accept it is to admit that such human knowledge as exists is infallible. This does not limit the probable fallibility of the human mind but does limit "knowledge" to that which is true. Much of which passes current for knowledge is simply belief, supposition, theory, opinion, etc.

A great fallacy is giving to a premise the weight of an absolute truth. The nearest we can come to defining this term is as follows: "An absolute truth is that which has been gained through experience, and from which there has been no deviation and from which it is not reasonable or desirable that there ever should be any deviation." This embraces what we term knowledge or known facts. Statements of absolute truths are often given in what we term axioms, but each statement called an axiom is not necessarily an absolute truth. A safe philosophy would be to take the known truths and argue from the known to the unknown to elucidate a theory, although the theory in its first conception may be wholly ideal. Some take a premise and from that evolve a theory that shall be sufficient ground for a hypothesis upon which a belief can be founded, which they insist must be accepted as a fact. Many metaphysical theories are as absolutely vague from premise to conclusion, as the above sequence would indicate.

No matter how perfect an Idealistic conception of

Being may be as a theory, the negation of the imperfect conditions, such as exist now, invalidates it as a working hypothesis by which to give us a conception of Being, embracing in its proper relation the present condition.

It is a fact that I believe matter exists (the word matter being properly defined) and not only exists but is indestructible. Now, I am not able to spontaneously change my belief, and really believe that this is an illusion. What is the cause of my believing as I do, if it has no basis in fact? If this belief is an imperfection, the hypothesis of an illusion does not satisfactorily account for the imperfection.

Dreams are real, even if the substance of a dream is not real, and if the dreams persist in being unpleasant, we try to find the cause and by so doing are able to remove the unpleasantness of the dream. It may be indigestion causing nightmare, or drugs causing hallucination, but we always premise a cause. If man's condition is not perfect, what is the cause of the imperfection? If his beliefs are not perfect, what is the cause? We do not want to wait until the hereafter to know; we want to know now.

I believe in Idealism, but I am of the opinion that many of the theories are more in the nature of ultimate truths than primary truths. They may be truths, but it will take time to properly prove them as such. I do not expect to know all the truths now; to know the proper relation of the universe of things would require an eternity. It is essential to understand the problem of human life as it is, and to do that, it is necessary to have a definite conception of the relation of things that are pertinent to the present just as they *now* exist.

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My conceptions are Idealistic in theory; Materialistic in fact; Dualistic in energy, and Monistic in action, but as combined the conception is different from that of the adherents of any one of these schools.¹

¹ As the author believes it embraces the essential truths in each of the other conceptions, he thinks it is entitled to be called "comprehensive."

CHAPTER II

PHYSICS

WITH these few cursory criticisms on metaphysical ideas we will leave, for the present, the Idealistic conception and take up the Materialistic conception. Here we are supposed to be on solid ground, in the world of facts, where nothing exists but matter and energy; where the law of cause and effect is stronger than that of the Medes and Persians.

But what causes such a wonderful variety in the forms of matter and energy? such a co-ordinated scheme of things? such a co-operation of the working parts? This is so apparent as to lead some of the Materialists, in an unguarded moment, to say that it might easily be taken for the work of some Supreme Intelligence. Science is not prepared to answer this. Materialism has nothing to do with metaphysics or first causes; at least Materialists are supposed to confine themselves to facts. In reality they do not do so. Idealists may theorize in metaphysics, but they are generally practical in their daily lives; so Materialists may insist that they live only on facts, but the most successful of them theorize and perform mental and spiritual gymnastics equal to any metaphysician. From my limited observation, I think that if the average Materialist were placed beside the average Idealist,

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they could not be told apart, unless labelled. The general opinion seems to be that the one should look like a pugilist, and the other like a seraph. He is mistaken who thinks that the Materialists confine themselves to facts for their conception of Being.

Theories regarding the relation of things generally precede the actual knowledge of such relation. To illustrate: The law of gravitation is supposed to be the most firmly established fact of all the so-called laws of nature. Judging from the literature on the subject, the popular conception of its discovery seems to be about like this: Newton wanting to know what kind of law governed the motions of the bodies composing the solar system, sat down and figured day and night for twenty years, and then exultingly shouting, "Eureka," waved to an anxiously-awaiting public the answer: The law of gravitation; bodies are drawn toward each other according to the product of their masses and inversely to the square of their distance. Such a sequence of events is not only an absurdity, it is an impossibility. When Newton was asked by what method he arrived at his discoveries, he answered, "By always thinking to them, I keep the subject constantly before me, and wait till the first dawns open slowly, little by little, into a clear and full light."

His *conception* of the law which would apply alike to apple and moon was precedent to the *demonstration*. In his first application of the law to the motion of the moon there was a failure to accord with the apparent facts or known quantities which are: velocity of falling bodies; (Had Newton believed Aristotle instead of Galileo this would not have been correct.) distance of the bodies; volume of the bodies. Of the latter it would

seem that there might be less known of the moon than the earth, but the mistake came from accepting the authoritative "sixty miles to the degree" as the circumference of the earth. That his faith in his opinion was stronger than his belief in the supposed facts is shown by his action on hearing that Picard had determined a degree to be 69.5 miles. Newton with feverish haste resumed his calculations. He applied his law as a known quantity accounting for the momentary deflection of the moon's curvilinear orbit from the direct line of the tangent. He anticipated the result and was so overpowered by nervous agitation that he was unable to go on, and requested a friend to finish it for him. When finished, it exactly established the inverse square as the true measure of the moon's gravitation, thus furnishing the key to the whole system.

Others may have before this stated the law as a theory. One at least took the theory that "according to the cube of the distance" was correct, as solids were proportionate to their cubes, but the specific gravity so discovered would hardly be within reason. Newton's conception of the law of gravitation was Idealistic. The first statement of it was a philosophical theory. Newton always referred to it as a theory.

Many philosophers would have been satisfied with such a statement, or, at most, showing why such a law should apply. Newton was not solely a philosopher, but a scientist, and was not satisfied with simply stating a theory. If it was capable of demonstration, he must demonstrate it and so at intervals for twenty years he worked to give a mathematical demonstration that the celestial bodies were related and moved according to a given law. Newton never said that these bodies moved or possessed mass because of this law.

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The law is simply a description of a certain relation of these bodies. If you asked a person why a car was moving on a track, and he told you that it was because it was going sixty miles an hour, you would probably think him a fool, or that he was jesting. Ask any one what causes a body to fall to the earth, and the chances are that you will be told that it is the law of gravitation which causes it.

Newton, the demonstrator of this law, said, that, to him, it was utterly inconceivable how an apple could fall to the ground; how one body could influence another body through space. Once, when I repeated this statement of Newton's one man replied that Newton must have been a fool not to know that the apple fell because it was heavier than the air. This answer is about as satisfactory as that it fell because of the law of gravitation.

My illustration shows that the idea of the relation came before the acceptance of it as a fact, and before it *could* be known as a fact to the demonstrator. I wish now to bring out a point to which I shall make more or less frequent reference; viz., the distortion of facts. We all agree that the law of gravitation is a fact (within certain limitations which I will hereafter mention), but a fact of what? Not a fact of cause. We give no explanations as to the cause. It is simply a fact of relation. Glance over the historical references to this discovery, and what do we find? Materialists proclaiming that the motions of the heavenly bodies are now fully accounted for without the necessity of an ultimate cause, and the theologians bringing down anathemas on their heads for doing away with their God. Galileo was damned for making the earth move, and now Newton was equally damned for showing how

it moved, *i. e.*, that its motion was definitely related to the motions of other bodies.

The use of the expression "law of gravitation" as a *cause* instead of a *relation* is pernicious. One scientist, whom I criticised regarding this, said, "You should no more object to the use of that expression in that way, than you would to the expression, 'sunrise,' and 'sunset': every one knows what is meant." I would also object to these expressions, only they are such a fixed part of our language as to make it useless to object. No statement should be made, if it can be avoided, which distorts facts and gives an incorrect idea of the true conception of Being. Some may object that this is simply quibbling over non-essentials, but I think whoever makes incorrect statements, or, I should say, statements incorrectly (one being a lie, and the other a mistake) is like one of my pupils, who seemed to give the correct answer to his problems, but when I looked over them, I could not comprehend them. He explained that he made a 5 for a 2, and a 2 for a 3, and a 3 for a 5. He knew what he meant, but I did not. This is the impression given by many of the so-called popular scientific articles.

The arithmetic from which I taught the boy just mentioned had the rule for subtraction, from which this is an extract: "If any figure of the subtrahend is larger than the figure of the minuend, borrow ten and add to that figure of the minuend before subtracting, then carry one and add to the next figure of the subtrahend." An inconsistent conglomeration, but following the rule will bring the answer, and that seemed sufficient reason for its persistence, for all the arithmetics I ever saw until those of recent date had a like rule

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The geography said that the earth rotated on its axis once each day, and revolved around the sun once each year. I often wondered what the author thought would happen if it should get a little ahead or behind time.

The text-books on physics said that air was *perfectly elastic*; that water was *perfectly elastic*; that sound travelled through water faster than through air, because of its *greater elasticity*.

These are samples of the distortion of facts. Scientists may disclaim responsibility for such errors, but even if the Materialistic conception of Being were true, a distortion of the facts would prevent a conception of the facts in their true relation.

We will take up another of the great triumphs of Materialism: evolution. With the exception of the change wrought by the recognition of the true relation of the attraction and motion of celestial bodies, no one thing has had such an effect on the ideas of men as the modern conception of their relation to other animate beings. Once again belief in the power of God was discarded for the force of the law. Scientists proclaimed the first cause Materialistic and theologians bewailed the waning power of God.

What is evolution? It is not a cause. It is an effect or result. Referring to a revolution we would say, "What was the cause or reason of the revolution?" So of evolution, we should speak of it as something accomplished. Evolution was no new idea even in Darwin's time, but previous to that time it was only a philosophical idea. As a philosophical idea it was not very disturbing. As the Church told one of the scientists in substance: "It is alright to make your statements as philosophical theories, but when you attempt to demonstrate them as facts, it is all wrong."

Darwin, being a scientist, wished to demonstrate, so he secured as much evidence as possible to show that evolution as a condition was the *result* of *material causes*. His hypothesis, elaborated by others, was that evolution was caused by natural selection and survival of the fittest; meaning that heredity and environment were sufficient to account for all of the various differences of animate being. No need of any special creations here. We know what "environment" is, but who knows what "heredity" is? Heredity is as incomprehensible as attraction. Darwin tried no more to show the *cause* of *heredity* than Newton did to show the *cause* of *gravitation*.

Here we have a condition with one of its supposed causes acknowledged as incomprehensible, and yet this word, "evolution," is used as though it were the "open sesame" to all biological knowledge.

CHAPTER III

UNDULATORY THEORY

IT is taken for granted that certain inconsistencies may exist in our theological beliefs because of our inability to comprehend the nature of God and man's true relation to Him, but when it comes to physics it is equally taken for granted that the facts (?) taught in our text-books are consistent.

We might make a statement of belief that would perfectly satisfy a primitive Christian, but such a statement might not at all satisfy a Christian of advanced ideas. In stating his advanced idea enough of the idioms would be retained to maintain orthodoxy, but the interpretation of them would be so different as to amount to a different belief.

It is just the same with various scientists. Haeckel says, "Science never retreats from a position once taken." The meaning conveyed is that any theory once acceptable to science is never given up until it is proved a fact. What he really means (though it does not sound so grand), is that when science once discovers a fact it becomes a part of knowledge and is indestructible.

Bacon says, "If false facts in Nature be once on foot, what through neglect of examination, the countenance of antiquity, and the use made of them in discourse, they are scarce ever retracted."

It is much easier for advanced Christians to interpret differently the tenets of their belief than to discard them entirely; so it is much easier for a scientist to re-interpret a theory that has become current than to discard the idioms of that theory.

In order to be specific I will consider the phenomena of sound according to the undulatory or wave theory of transmission.

The pertinent point of this theory is the definition of the term "wave." Tyndall, Helmholtz, Mayer, and many others have defined and described it, and any text-book on physics will show a repetition of one or the other of these definitions.

Ask one of the scientists of *advanced* ideas to define a wave, he will reply by giving a geometrical formula and possibly describe it in words by saying "a wave is anything periodic both in time and space." In refusing to be any more definite he will affirm that it is incomprehensible that a wave, according to the ordinary conception of the word, could occur *in* a medium and account for the various facts of the phenomena.

In other words, they mean that by *defining* and *describing* the sound-wave the scientists of the past and the majority of the present have taken a position which is untenable. But rather than repudiate the commonly accepted and continuously taught and supposedly comprehensible wave theory, they reinterpret the definition of wave, and in order to be orthodox still maintain the integrity of the wave theory.

According to the limited definition of wave given above, there is absolutely no attempt to define the mechanism of the transmission of the sound.

The current theory of sound *does* attempt to do this,

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and in my criticism of what I think is an erroneous conception, I admit that advanced physicists recognize these errors.

I will quote as briefly as possible the current theory of sound and call attention to the point, that where the language is definite it is inconsistent; and when indefinite, it is interpreted in more than one way; and as a mechanism, it is not consistent with mechanical laws.

The chief inconsistency is in not discriminating between the mechanical movement of the air and the atomic movement of its particles. The fundamental error is in assuming that sound and its transmission are due to such mechanical movements of the air as are demonstrated to occur.

If we say a table is in motion, meaning that only the atoms of the table are in motion, we are by such a statement distorting the fact, because usually when we say "a table," we mean the form or body and not the material of which the body or form is composed.

When we say undulations of the air, we must consistently mean movements of the mass of the air and not an atomic movement such as causes or occasions osmose.

In the following description of sound, you will note that sometimes it indicates a motion of the air and sometimes a motion of the atom; sometimes an undulation of the mass and sometimes a vibration of the particles.

Tyndall says:

Amid the grosser phenomena of acoustics the mind was first disciplined, conceptions being thus obtained from direct

observation, which afterward applied to phenomena of a character far too subtle to be observed directly.¹

So I will start with this theory of sound, which is the acknowledged basis for other theories of physical phenomena. Authorities agree, and their phraseology is similar, as to the theory of sound, so I will quote Tyndall further as an illustration.²

Sound we know to be due to vibratory motion. A vibratory tuning-fork, for example, moulds the air around it into undulations or waves, which speed away on all sides with a certain measured velocity, impinge upon the drum of the ear, shake the auditory nerve, and awake in the brain the sensation of sound. When sufficiently near a sounding body we can *feel*³ the vibrations of the air. A deaf man, for example, plunging his hand into a bell when it is sounded, feels through the common nerves of his body those tremors, which, when imparted to the nerves of healthy ears, are translated into sound. There are various ways of rendering those sonorous vibrations, not only tangible, but visible; and it was not until numberless experiments of this kind had been executed that the scientific investigator abandoned himself wholly, and without a shadow of misgiving, to the conviction that what is sound within us, is outside of us, a motion of the air.

It is made very plain that by this theory (which is the theory commonly taught for a fact), sound is a vibration of the air that can be actually felt by the hand, and which, when intercepted by the ear, is translated into that audibility of which we are conscious through the sense of hearing.

It is recognized that sound is applied first as a term

¹ *Fragments of Science*, page 80.

² In each instance the italic is mine.

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representing the motion of the air, and second, as that of which we are conscious as being audible. When there is not a constant relation between the different methods of application, there must arise ambiguity, unless they are identified. I will call the first the "sound-wave" and the second, simply "sound."

Physics treats of the sound-wave, and its laws are based in accordance with the laws of physics. Our consciousness of sound is on account of its audibility.

Let us take the laws of sound (*i. e.*, sound-wave), and apply them to sound. I will quote Tyndall again. He gives in this illustration the explosion of a toy balloon:

In the case of our exploding balloon the wave of sound expands on all sides, the motion produced by the explosion being thus diffused over a continually augmenting mass of air. It is perfectly manifest that this cannot occur without an enfeeblement of the motion. Take the case of a thin shell of air with a radius of one foot, reckoned from the centre of explosion. A shell of air of the same thickness, but of two feet radius, will contain four times the quantity of matter; if its radius be three feet, it will contain nine times the quantity of matter; if four feet, it will contain sixteen times the quantity of matter, and so on. Thus the quantity of matter set in motion augments as the square of the distance from the centre of explosion. The intensity or loudness of sound diminishes in the same proportion. We express this law by saying that the intensity of the sound varies inversely as the square of the distance.¹

Let us test this law. Standing first one foot from a person speaking in an ordinary tone of voice, we judge of its loudness, and then move to ten feet and find that

¹ *Sound*, page 41.

the voice is only a hundredth part as loud; or to invert the experiment we stand ten feet from a person speaking, and upon advancing nine feet, we find that the voice is one hundred times louder. Try the law another way. A whistle at one foot would sound just as loud as one hundred such whistles at ten feet. You do not believe it? Open any text-book on "Sound" and see if that is not the law.

Again, you are one hundred feet from a band playing, but when you move up to ten feet, it sounds equal to one hundred such bands, and if you should have the temerity to advance within one foot, it would be one thousand times louder than at first. Absurd? Undoubtedly, and it would be even more absurd if the law were made logical.

Tyndall says, "Take a thin shell of air at one foot, and a thin shell of air at two feet. "Thin," according to his law, *must* mean of no measurable thickness, but every particle of air between the one and two feet radius is moved. Suppose you try to move a ball of matter whose radius is twice that of another ball, would you need only to exert four times the force? Try it, and you will find that the balls are proportionate to the *cubes* of their radius, instead of proportionate to their squares.

While the perception of various persons vary, the average or normal person is the judge as to the intensity of sound, and when theory says "the intensity of sound varies inversely as the square of the distance from its source," we know that it is not so. If the physicist should say, "the intensity of mechanical vibration of the mass of the conducting material, which is incident upon the generation of the phenomena which we call sound, decreases inversely as the square of the distance," it would be a correct statement.

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According to the undulatory theory of sound, thousands of tons of air are set in motion by a bird singing, and the text-book remarks that it is wonderful how much energy can originate in the throat of a little bird. It is indeed wonderful, and if it were so stated in the Bible, instead of a text-book on physics, it would be called a miracle.

It has been estimated what is the least amount of energy that will set in vibration the tympanum of the ear, and from the result of this, which may be found in a Harvard University text-book, it is estimated that a locust which can be heard one mile must exert energy enough to lift or set into vibration (which means to lift for a measurable distance, which distance, is called the amplitude), over sixty million tons.

If scientists can accept a theory which necessitates such admissions, they ought not to hesitate to believe that the walls of Jericho fell at the blast of the horns.

The undulatory, or "wave" theory, of sound is based on the ideas of waves on the surface of the water, which radiate from a central disturbance. These waves have a length (from crest to crest is a wave length) and an amplitude, which is the depth of the wave from crest to depression or valley.

There is always a certain proportion or relation maintained between the length and height of a water wave, or, as we have termed it, between the length and the amplitude. In the sound-wave the air is supposed to be condensed to a maximum, then it reacts, causing a rarefaction. The wave-length is from condensation to condensation, but there is no amplitude to this wave. The amplitude refers to the vibration of the *source* of the air wave, and the particles composing the air wave, and there is no relation preserved between

the wave-length and the amplitude. The amplitude of vibration of one tuning-fork may produce air waves of twice the length of an equal amplitude in another tuning-fork.

Suppose we have one tuning-fork giving two hundred vibrations a second, and another one giving four hundred vibrations a second, but of equal length of vibration (amplitude), it would necessitate one fork vibrating faster than the other one. In the first case the wave-length would be about five feet, and in the second about half that. It is plain that the analogy of waves of water to waves of air is not logical unless all the relations are preserved. The use of the word "amplitude" not having any fixed relation to the wave-length is apt to be indefinite. In the undulatory theory of sound the particles of air are supposed to move only a short distance when the resistance of the other air particles force them to stop, and then to recoil. This motion, like a pendulum, is accelerated and retarded, having a maximum velocity at a certain point. I will quote again:

"The *intensity* of the *sound* is proportional to the square of this maximum velocity."¹

"The distance through which the *air particle* moves to and fro, when the sound-wave passes it, is called the amplitude of the vibration. The *intensity* of the *sound* is proportional to the square of the amplitude."

It is plain from the wording of the above laws (which being quoted verbatim from an authoritative source ought to be definite), that velocity and amplitude *must* bear a fixed relation, for if *intensity* is proportional to the square of each of them, then when intensity varies, each must vary in a like degree (*i. e.*, the relation

¹ *Sound*, page 42.

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must be constant); but we have seen from the illustration previously given that velocity may be doubled and the amplitude remain the same, and the intensity (or loudness) would not necessarily be changed.

That which would be changed is called the "pitch." If the pitch remains constant, then the law might apply to the mechanical movement.

There seem to be three terms necessary in the elucidation of theories of the propagation of sound-waves;—velocity, amplitude, and wave-length. Velocity is the essential in the corpuscular theory, amplitude is the essential in the vibratory theory, and wave-length is the essential in the undulatory theory.

The condensation and rarefaction of the air with its accompanying generation of heat and cold is the key to the undulatory theory. But look through the illustrations of experiments and you will find none of them will work, if carried beyond where there is an actual *mechanical* disturbance of the air. For instance, let an instrument be fixed to give out twenty beats a second at fixed intervals, which would give wave-lengths of about fifty feet; let us fix a thermopile at four wave-lengths, and see if there is any variation in heat; let us fix the condenser and see if we can focus the sound-waves; let us fix an instrument that will cut a wave in half, in front of our ear, and see if our ear will detect the variation. The mere statement of these experiments is sufficient to convince any one that they would be futile.

Returning to Tyndall again, we find this:

Thus each shell of air, if I may use the term, surrounding the balloon took up the motion of the shell next preceding, and transmitted it to the next succeeding shell,

the motion being thus propagated as a *pulse* or *wave* through the air.

The motion of the *pulse must not be confounded with the motion of the particles which at any moment constitute the pulse*. For while the wave moves forward considerable distances, each particular particle of air makes only a small excursion to and fro.¹

This is quite plain that it is the *pulse* or *wave* that propagates the sound. He then proceeds to illustrate by a series of balls what he means by particles.

The process may be readily represented by the propagation of motion through a row of glass balls, such as are employed in the game of solitaire. Placing the balls along a groove, each of them touching its neighbor, and urging one of them against the end of the row; the motion thus imparted to the first ball is delivered to the second, the motion of the second is delivered to the third, the motion of the third is imparted to the fourth; each ball, after having given up its motion, returning itself to rest. The last ball only of the row flies away. *In a similar way is sound conveyed from particle to particle through the air*. The particles which fill the cavity of the ear are finally driven against the tympanic membrane which is stretched across the passage leading from the external ear toward the brain.

This makes it quite plain that it is the *particles* that convey the sound.

Unless there is a difference between the meaning of the words "propagate" and "convey," there must be no difference as to the method of transmission; yet, we are cautioned not to confound the "motion" of the *particles* with the "motion" of the *pulse*. If we use the "pulse," it is the wave theory. If we use the

¹ *Sound*, page 32.

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"particles," it is the vibratory theory. There is absolutely no fixed relation of one to the other, nor is there any continuity of explanation in the text-books, as the author shifts from one to the other.

Why, it may be asked, is there this lack of definiteness and consistency in a theory so commonly accepted? Simply because the theory has no more bearing on *practical* life than the various religious theories or beliefs have.

When we come to the manufacture of musical instruments, and practical acoustics, no attention is paid to these theories and laws of sound. Theory and practice in this respect absolutely do not accord. If a pipe-organ were built according to the laws of sound, as taught in our text-books, it would be of no practical use. Then what is the use of the text-book theories? Can any one tell?

In the last quotation of Tyndall he says it is the "particles" which affect the tympanic membrane. In his previous quotation, he says, it is the "undulations or waves" which impinge upon the drum of the ear. Now, we might not think this made much difference, but you see we have been cautioned *not to confound one motion with the other*. You might say this ambiguity is the fault of the author from whom I quote, but no other writer that I have read is more definite.

As I have said before, some advanced physicists escape the dilemma by refusing to be definite.

The fault is with the theory, which if incorrect, must of necessity be indefinite in shifting from one phenomenon to another.

The theory of transmission of sound is the same whether the medium is air, liquid, or solid. If, in the foregoing definition, we substitute the word "iron"

where "air" is used, the absurdity of the description will be evident.

I will now refer to the velocity of the particle in the amplitude:

When a common pendulum oscillates it tends to form a condensation in front and a rarefaction behind. But it is only a *tendency*; the motion is so *slow*, and the air is so elastic, that it moves away in front before it is sensibly condensed, and fills the space behind before it can become sensibly dilated. Hence waves or pulses are not generated by the pendulum. It requires a certain sharpness of shock to produce the condensation and rarefaction which constitute a wave of sound in the air.¹

When Tyndall says the motion of the pendulum is *too slow*, as a contrast, he should have said it required a "swifter motion," instead of saying a "sharpness of shock." This is remedied on page 95 where he says:

How are we to picture to ourselves the condition of the air through which this musical sound is passing? Imagine one of the prongs of the vibrating fork *swiftly* advancing; it compresses the air immediately in front of it, and when it retreats it leaves a partial vacuum behind, the process being repeated by every subsequent advance and retreat. The whole function of the tuning-fork is to carve the air into these condensations and rarefactions, and they, as they are formed, *propagate themselves* in succession through the air. A condensation with its associated rarefaction constitutes, as already stated, a sonorous wave.

Here he mentions the "prongs swiftly advancing" as accounting for the condensation. Now as a matter of fact the prongs of a tuning-fork do not move through

¹ *Sound*, page 35.

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space with as great a velocity as the pendulum. It is in various places stated that the velocity of the moving particles is dependent on the velocity of vibration of the fork, and this would seem to be a mechanical necessity. As a wave is composed of these vibrating particles how can the *wave* have any greater *velocity* than the *particles*? Yet we know that velocity of transmission of sound is *not* dependent on the velocity of the initial vibration.

It is stated that velocity of transmission is dependent on the elasticity and density of the transmitting medium. But that statement in no way aids to a comprehension of the mechanism of the transmission.

The essential part of the undulatory or wave theory is the condensations and rarefactions. It is plain that without these there could be no wave in the substance. The chief way in which the physicists claim to have demonstrated these waves is by so-called interference. In the experiments on interference in sound there is no demonstration but what is misstated or misleading. When a student tries these experiments and does not get the authorized result, he does not say that authority is mistaken, but thinks, of course, he himself is in error from inaccuracy. When authority says, "turn the tuning-fork so the corners of the fork are toward the ear and absolute silence results," and the student does this and gets only comparative silence, he thinks he or the fork is to blame, for surely authority knows the difference between "absolute" and "comparative." The student has been told that this "absolute silence," (?) when the corners of the fork are turned toward the ear, is caused by the wave from one prong interfering with the wave from the opposite prong, *i. e.*, condensation from one prong coinciding with the rarefaction from the other prong. If the student happens to notice that

the *same result* occurs when there is only *one* prong or single vibrating bar, *i. e.*, at certain angles the intensity of the sound is less, he may wonder where the interference comes from, but as there is *comparative* silence he supposes it must come from somewhere and so accepts interference as a necessary cause and investigates no farther.

In all cases of the so-called demonstrations of the wave theory by interference, the comparative lessening of sound can be explained in other ways, and many cases of lessening intensity of sound cannot be at all explained by using the interference interpretation of the wave theory.

Many other criticisms could be made of the undulatory theory of the transmission of sound but space forbids. It is hardly likely that any scientist will change his opinion on account of these criticisms, for psychology shows that when one absolutely believes in a thing or theory it is difficult to receive any exterior suggestion contrary to that belief.

I will go one step farther on this subject of sound. We finally reached the tympanum of the ear, by whichever route you prefer, "particles" or "waves." How the sound-wave is translated into sound is more of a study in physiology than physics. About the only attempt at explanation of the function of any of the various organs in the translation is the theory that the Corti cords vibrate in synchronism with the various sound-waves that enter the ear. When it is objected that it is a physical impossibility for a definite number of fixed cords of definite size to vibrate in an infinite variety of ways, the physiologist explains that some auditory nerve perceives the pitch, and excites a muscle, which regulates the tension of the cords. While this is theoretically possible, it is

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practically impossible; but even if it were possible, of what use would the cords be if there is a nerve which could perceive and recognize the variation in pitch, previous to the action of the Corti cords?

Rather than accept such a crude explanation, it were better to leave it and say with Tyndall, "it is a mystery which the human mind cannot fathom."

In leaving the subject of sound, I wish to emphasize one point: when we, as human beings, speak of sound, we ordinarily mean that which is audible; which is perceived as sensation through the sense of hearing, and we may through this sense of hearing perceive sound, when no motion of any kind can be detected by any instrument made by man.

I will endeavor later to give a consistent theory of the transmission of sound.

In taking up the subject of light, I will quote again from Tyndall:

We never could have measured the waves of light, nor even imagined them to exist, had we not previously exercised ourselves among the waves of sound. Sound and light are mutually helpful, the conceptions of each being expanded, strengthened, and defined by the conceptions of the other.

The ether which conveys the pulses of light and heat not only fills celestial space, swathing suns, and planets, and moons, but it also encircles the atoms of which these bodies are composed. It is the *motion* of these *atoms*, and not that of any sensible parts of bodies that the ether conveys. This motion is the objective cause of what, in our sensation, are light and heat. An atom, then sending its *pulses* through the ether, resembles a tuning-fork sending its *pulses* through the air.¹

¹ *Fragments of Science*, page 83.

You will notice that the undulatory theory of light is based on that same theory of sound, and all the arguments that might be used against the validity of such a theory applies here. Then it will be noticed that the same ambiguity is present as to whether it is the motion of the particles (*i. e.*, atomic vibration), or the waves or pulse which occasions this conveyance.

In addition, with the effect of intensifying the ambiguity already existing, a new medium is brought into existence to perfect the undulatory theory of light. This medium, called the "luminiferous ether," is something which has not been described except in a self-contradictory way, which is acknowledged to be absolutely inconceivable as a substance, and which is not supposed to be at all necessary except as a part of the undulatory theory of light.

What do we ordinarily mean by light? We mean that which is perceived by our consciousness as luminosity. When we talk about the "invisible light waves," it is a paradox.

We frequently see the assertion that heat, electricity, and light are interchangeable; but light is not interchangeable with heat as may be shown by two illustrations:

1. Before an ordinary ray of the sun or electric lamp, place a screen of a proper iodide compound and the luminous portion of the ray is cut off, but the heat and actinic rays are uninterrupted.
2. On placing a proper ammonia compound in the ray, the heat and actinic rays are cut off while the luminous rays pass.

In hundreds of recorded tests of these experiments, there is in the first no measurable loss of energy by the abstraction of the light rays; and in the second there

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is no way of measuring the intensity of the light rays, as there is present in these rays no measurable amount of energy. Regarding these experiments I insert this quotation from *Molecular Physics*¹:

In other words, the luminous radiation intercepted, though competent to excite vividly the sense of vision, was, when expressed in terms of actual energy, absolutely incapable of measurement.

We find it is true of light as of sound that the organs of sense can detect forms of energy which are absolutely immeasurable by any instrument made by man. Because rays are known to exist and instruments are made to detect heat, actinic, and various other rays of which we would otherwise be unconscious, some jump to the conclusion that these instruments are more sensitive than the eye. But the eye is no more intended to detect any ray but the luminous ray, than the nose is made to see. Quite to the contrary, the eye is especially formed to cut off any other kind of ray. In the first experiment, just stated, the non-luminous rays with an intensity sufficient to kindle wood or melt iron might be focused directly into the pupil of the eye, and no effect would be perceived; that is, no sensation would result.

It can be seen that light can be separated from the heat and actinic rays which usually accompany it, and that there is no *measurable* relation between them; yet, all the laws, rules, and regulations are made from observed measurements of heat or actinic rays, and then by *analogy* applied to light. When the law thus derived tells us that one candle at one foot from the eye is as bright as one hundred candles at ten feet, our sense of sight does not sanction the law.

¹ Page 266.

I will consider the part of physics called heat.

The subject of heat is so thoroughly complicated and indefinite that I hardly know how to approach it. There is no authoritative definition of heat. Most people would say, "It is the higher variations of temperature." It is frequently inferred as a cause, by the expression, "the expansive power of heat." It is scientifically accepted as a "mode of motion." If we accept heat as a "mode of motion," what definite terms have we to apply to "the force of expansion," "the repulsive power," "the innate elasticity," etc.?

This word heat has no constant definition. Expressing either cause or effect, and frequently expressing both in the same sentence, it is useless to try to give any common conception of heat. But whatever the conception we must take the language as we find it.

"Radiation of heat" is a frequent expression. Tyndall said:

Ages ago the elementary constituents of our rocks clashed together and produced the motion of heat, which was taken up by the ether and carried away through stellar space. It is lost forever as far as we are concerned.

Proctor says¹:

It may be asked what becomes of the heat that is radiated from the sun and other stellar bodies? We cannot tell, all we know is that it is not lost.

That reminds me of the little boy, who, when crossing the ocean, dropped his knife overboard, and being twitted upon having lost it, he answered: "It is not lost, for I know right where I dropped it." So of the

¹ *Other Worlds than Ours*, page 91.

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heat which scientists say has for endless ages been radiating into space. We know it is all out there in space, because it could not get away. It may be "lost to us forever," but it is there. A satisfactory sort of conception, is n't it?

I wish to insert here an extract from a work of Sir Oliver Lodge¹:

Heat like water can travel in only two ways, by conduction and by convection. Radiation is not conveyance of heat. If water were dissociated in one planet and carried to another planet as gas and there recombined as water it would not be water travelling from one planet to another. Nor would that which travelled obey the laws of the motion of water.

What is it that *has* travelled? For water and gas we have a common name, "Matter." Have physicists a common name for "heat" and "radiation"?

Let us examine this *radiating* closer, and see if we can find out how it is done. The definition of radiation is "shooting out" or "throwing off." If a ball is thrown off the earth, the initial throwing force, being terminated, is finally overcome by the power of attraction, which is constant, and the ball returns. At the outward end of its radius there is nothing "thrown off." It might touch a spider's web without bending it. The ball returns intact. Because for an infinitely small space of time the motion of the ball has ceased, we would not say that it had been radiated.

Now instead of the ball, let us take one exterior atom in the chromosphere of the sun. This atom is thrown off by some force, but is held by the power of attraction. We might suppose this atom to be expelled beyond the

¹ *Modern Ideas of Electricity*, page 66.

power of attraction to draw back, but to suppose this would be to admit the old corpuscular theory of light, which we do not believe accords with facts. But if we agree that the atom does not go beyond the pale of attraction, then there is a time when the attraction, which is constant, must overcome the initial force which is terminated. We have said the outward motion is overcome by attraction. There is nothing else to stop it. There is no friction from a passage through the atmosphere, for this is part of the atmosphere. It is not stopped by contact with other atoms, for this is supposedly the outside atom. It is not stopped by the ether for, according to the description of ether, it is a non-resisting medium.

We say of the ball that in its fall to the earth it generates just as much force as was first required to throw it off. Why should not this hold good of the atom, and why should it not in its return generate energy equal to the initial force? But to come again to the point; just what is it that is radiated? We agree that the atom is not radiated into space. Is it the motion? We said of the ball that no motion was lost, and it seems equally true of the atom. But suppose it were a motion. Has any Materialist made the attempt to define a motion apart from a thing moved? Suppose we say it is the ether that moves. What moves the ether? Unless we admit that the ether is a resisting medium, the atom could not have moved it. Is it the force which is radiated? If so, what is the force? It cannot be heat, for scientists say, "heat is simply a mode of motion." But if they insist that it is a force which moves the ether, then I say, that to assert that an immaterial, unnamed force moves an immaterial, indescribable medium, is to sink physics pretty deeply into metaphysics.

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Practically the only accuracy in physics is found in that part which might be classed under the head of mechanics and mathematics.

If the theories of physics were in accordance with the facts, that is, if our conception of Being was correct, there need be no indefiniteness in our descriptions or definitions of anything which we could really comprehend.

As I have said before, the misconception arising from the use of certain words limits the effect of the language by which we must try to define this conception,—but I shall make the attempt nevertheless.

A different conception is not necessarily a revolutionary conception. I think that my conception is not revolutionary though some of the theories might be called “revolutionary theories.” (The reason for calling them revolutionary theories may be seen farther on.) As a conception it is more in the nature of shifting the relations than of generating or opening any new mine of knowledge.

CHAPTER IV

THEOLOGY

BEFORE entering on an expression of my own conception, I wish to consider briefly the orthodox theological views.

Practically all of the theological views are Dualistic. Not a great many years ago people were ready to fight for their theological views, and to compel others by physical force to adopt their opinions. This proselytizing by force has now happily passed, and even the spirit of intolerance and religious ostracism is rapidly passing. I wish to add a word to accelerate the passing.

The fact should be emphasized that knowledge, opinion, belief, and faith are not synonymous terms. No matter how loud a man may shout, "I *know* that my Redeemer liveth," he is using incorrect language. That quotation may express the opinion of many; many may believe it implicitly; and their faith that it is so may be immovable, but "knowledge" is a superlative term, which should be more sacred than to be used to define things that cannot be *known*.

The writings of various religions, which are believed by many to be inspired and to be infallible, have no authoritative weight with those who do not so believe. The *proper* interpretation of these writings is a matter of faith with some, a matter of belief with many, and a

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matter of opinion with few, but it is a matter of knowledge to none.

So far as I am concerned, I do not believe that "eternal salvation" could hinge on the interpretation and acceptance of a statement which could be misinterpreted or be subject to a doubt.

Paul may have known that he saw Christ in a cloud, but when he tells me that he saw him, should I find it necessary to form an opinion, I may believe that he did see him, or I may believe it to be an illusion or a delusion; and then again, I should feel perfectly free to think it a wilful lie, if the evidence tended that way.

It will no doubt be said that I am antagonizing religion. The truth of the assertion will depend on the definition we give religion. I might fill pages with equally authoritative definitions of religion. I will give four covering a wide range of opinion.

SENECA—To know God and imitate Him.

KANT—Religion consists in our recognizing all our duties as Divine commands.

DR. MARTINEAU—Religion is a belief in an everlasting God; that is, a Divine mind and will, ruling the Universe, and holding moral relations with mankind.

RUSKIN—Our national religion is the performance of church ceremonies, and preaching of soporific truths (or untruths) to keep the mob quietly at work while we amuse ourselves.

I will add my own definition: "To know God." This last definition I think should be first. (However, according to my conception the word "God" as used here is tautological.)

To one who shies at the name of *God*, my opinion

will appear ultra-religious. To one who has (or thinks he has) a comprehensive conception of God and an opinion of how He is to be imitated, my opinion may appear Atheistic. To one who thinks our duties call for a sacrifice of the Here to the Hereafter, my opinion may appear iconoclastic. To one who is satisfied with his *belief* in God, my opinion may appear to be sacrilegious. To one whose faith is simply credulity, as Ruskin suggests, my opinion will probably not appear at all except in a very indirect way. Because many religious people are pious, that pretence we term "pietism" commonly parades as religion, which has resulted in bringing obliquity on the word "religion."

"But," says one, "while you may have a *form of religion*, you attack Christianity." The truth of that assertion would depend on the definition we give to Christianity. There is no accepted authoritative definition. In fact, no definition can be formulated that would be at all characteristic of each and every class professing to be Christians. Think for a moment how wide a range of diversified opinions are necessarily grouped under the word "Christian." We can readily see that an opinion cannot be expressed without assailing or being in opposition to some other opinion. Defining a Christian as a follower of Christ is no more definite than the word itself. If any Christian form of religion can be embraced within my definition of religion, well and good.

But any form of religion, be it Christian or anti-Christian, which is found to be inconsistent, with the facts or our increasing knowledge of God, *must* of necessity be abandoned eventually. This statement appears incontrovertible. Therefore, in our search after God that we may know Him, let us not dispute

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about the *forms* of the religion which we may eventually retain.

Heterodoxy is no longer considered a crime. While *every heterodoxy* may never be orthodox, certain it is that *every orthodoxy* was *once* heterodox.

To those who believe the Bible, let me refer them to the place where Christ said¹:

"I have yet many things to say, but ye cannot bear them now."

Paul said in substance²:

Ye have need of milk, because ye are not able to bear meat. Only those are able to bear meat who by use of their reason know good from evil.

If you believe the Bible, you must believe that sometimes people by the use of their *reason* will know good from evil and will be ready to be weaned from the traditional beliefs, rules, and regulations, and advance to something higher. Because the babe grows and prospers on milk is no good reason why it should never give up such a diet. If, through a weak fear of a change, it is not given or will not take any different diet, it will never attain the stature of a man. If God ever could speak to man, He can speak to him now; so it were better to get the mind advanced from the message of two thousand years ago, and open it for the reception of the message of to-day.

I do not believe a correct conception of God's message will be revolutionary, but evolutionary. Our conceptions of Being have not all been wrong, but we will agree that *some* of them have been wrong and *some* of them may still in part be wrong. Let us be free to compare our own opinions and beliefs with those of others and choose that which is good.

¹ St. John xvi: 12, 13.

² Hebrews v: 11.

No doubt criticism will be made by those to whom the terms "religion" and "Christianity" convey a specific idea. To many they may seem synonymous.

The greatest difficulty encountered is to cause single words to convey the exact idea intended; many words, such as power, desire, force, fear, law, love, spirit, express ideas susceptible of different construction. It is impracticable to modify each word each time it is used. It is also impossible to convey a definite idea of this conception in any single statement or chapter.

When reading this over, do not jump at conclusions and by putting your own construction on words think they express ideas contrary to the truth.

So great a man as Daniel Webster, when walking on the bank of a river one day, disputed his friend's word. The friend had said that they were on the *other* bank of the river. Webster denied it and immediately offered to bet a hat that his friend could not prove the statement. "Done," said the friend, "that is one bank over there, is it not?" pointing across the river. "Certainly," said Webster. "Well, this is the *other* bank, is it not?" Webster could not deny it, so lost the hat.

Now I do not want to prove that we are on the other bank of the river; but I think, without a quibble, I can show you that the other bank is not so far off as we usually think, and possibly may be right under our feet.

Members of the human race all over the earth are struggling for a solution of the question, "How can we obtain our desires and be happy?" There are thousands of different and seemingly contradictory answers and most of them have that final despondent

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reply, "Not until we get to the *other* bank of the River."

Where, in the teachings of Christ or the Apostles, can you find proof of such necessity? "Now is the accepted time; now is the day of salvation."

CHAPTER V

POWER

IN my conception of Being I am governed by certain simple principles which may be more easily comprehended from an understanding of the philosophy of the conception than from a statement of these principles in advance. Yet with the hope of aiding the reader to keep the drift of the conception, I will give a brief statement of the essential points.

There are two and *only* two first causes or uncaused Entities or Essences. These I term Power and Force. As these names give only a physical conception I name them also Desire and Fear. Power is atomic in its structure, each atom being an individual Desire, possessing consciousness, memory, and volition. Associated with each atom of Power is a certain (not constant) amount of Force, which, as a motor, is essential in all material forms and manifestations of energy. The Power of an atom never changes. The Force associated with an atom may change from one atom to another but always as some peculiar form of motion. Universally, Power controls Force; locally, Force may overcome Power. Power and Force are manifest as the Supreme Being or Universe.

I am asked to define Power and Desire, Force and Fear. Can the Idealist define the Absolute? Will

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the Materialist attempt to define Nature? Does the Dualist give a definition of God? Must the Monist define the Universe?

Socrates has already been quoted. "Define terms and discussion ceases"; but it is impossible to define the indefinite.

Suppose I am asked to define eternity, and I say that eternity is the infinite or indefinite extension of time. I define by saying that it is *indefinite*, which is negative or no definition at all. That definition may give you some idea of what I mean by the term eternity and that my use of the word designates a time relation and not a space relation.

We must assume that some ideas are comprehensible. We may claim to comprehend that the relation of an hour to a minute is definite because it is measurable. Time is a definite term only to the degree in which we can measure it. When we, in our conception, extend the idea of time to where, by any figure of speech or by imagination, it is impossible to measure it, and we call it eternity, we express by the term a time relation, but an absolutely indefinite, unmeasurable, and incomprehensible relation, excepting that it is a time relation.

This definition of what I mean by the term eternity is, I think, practically what any one means by the word, for the reason that eternity is the only term used in our language to express this particular idea. All agree that I use the word in the proper form because *all* use it in that manner.

When I attempt to define what I mean by the terms Power and Desire, Force and Fear, I do not find so ready acceptance of my definition, because these specific terms are used in expressing other and different ideas,

and the ideas which I wish to express by these terms are also expressed by a great variety of terms.

The choice of the term is, of course, simply arbitrary. I might, as many have done before, invent new terms and thus avoid a conflict, but the extra mental effort necessary to carry an old idea through the vehicle of a new word more than offsets any advantage gained.

The use of *two* terms to define one entity is to me an absolute necessity because I am making the attempt to more definitely relate the abstract to the concrete, noumena to the phenomena, than I think is done by other conceptions.

We accept intervals of time as being definite and measurable, but they are measurable only by a given body moving a definite distance through space. Innumerable pages have been wasted in the effort to elucidate an idea of time and space, independent of each other and of material being.

Time and space are aspects of the relation of material being, but are actually *inseparable aspects*, although abstractly we use the terms separately.

Power and Desire, Force and Fear are *inseparable actually*, but as aspects we must consider them separate.

Time and space, right and left, top and bottom, centre and circumference, are inseparable as aspects but separate in reality.

Power and Desire, Force and Fear, are inseparable in reality but are separable as aspects.

I mean by the term Power to convey the idea of the primary cause of phenomena, which might be designated by such terms as attraction, gravity, cohesion, affinity, love. This, according to my idea, is the Supreme or greatest *motor*.

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I conceive this Power to have an intelligent *motive*, and this aspect I designate as the Desire.

I conceive of no spontaneous movement without a motive and as the *movement* would be a materialization of the Power, so it would also be a manifestation of the Desire. In the materialization of Power and the manifestation of Desire, I conceive there is necessary a resistancy or a different form of motion; the cause of this I term Force. To every form of Desire there is a certain inhibitive which I term Fear.

I consider that we, as human beings, are a materialization of Power and a manifestation of Desire, and that in the evolution of this form Force and Fear are essential. The manifest materialization which we term Being is cognized, recognized, perceived, interpreted, and conceived only through that material portion called the five sense organs. It is immaterial to us, as human beings, whether or not there are other manifestations of the Supreme Desire. It is not important what specific terms be used to designate the First Causes, but if true, it is pertinent to a correct conception that we recognize that there are *two* and *only* two entities which are the primary cause and occasion of all phenomena.

The truth in an idea makes it ideal and when there is a definite and true relation between the real and the ideal, the ideal may be realized and become a reality.

The foregoing principles so briefly stated must be sufficient to account for all the phenomena of nature, consistently, logically, and as a whole, more simply than any other conception, or it is lacking in value.

I wish, however, to have the reader governed by certain standards of criticism. The conception is philosophic rather than scientific.

I wish the reader to thoroughly comprehend the

difference between scientific and philosophic. Science treats of *phenomena* and their relation, and its facts are demonstrated by universally *admitted* assumptions. The *causes* of phenomena are considered abstractly on account of their being metaphysical.

Philosophy treats of the *causes* of phenomena *concretely* and endeavors to demonstrate logically by *assumptions* which are *not* universally admitted and which may be with equal weight denied. A falling ball may be a scientific fact, but gravitation at one time was only a philosophic idea. And that there could be a "law of gravitation" was quite an advanced philosophic idea. That gravitation is caused by attraction is solely a philosophic assumption.

Philosophic ideas become scientific only as they become universally admitted, and yet the universal admission of an idea does not determine the *truth* of the idea.

Scientist and theologian must be dogmatic. The philosopher is inconsistent if he is dogmatic. The scientist assumes to *know* physical facts. The theologian assumes to *know* spiritual facts. The philosopher assumes certain relations to exist between the physical and the spiritual. The scientist also knows that to the physical there is a co-existent psychical (spiritual). The theologian also knows that spirituality *must* have an object. The philosopher tries to make the records accord and be in concord. Each is a specialist. Each is a necessity in the development of humanity. But as each is impressed with his own importance he is prone to discredit the relative importance of the other.

To my mind the term philosopher is the highest designation ever applied to man. The ordinary artisan may call himself a scientist and every pulpit pounder

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does call himself a theologian, but of those who have attained a place in history you will notice that the majority have "and philosopher" appended to their other qualifications, and it was being a philosopher (thinker) that occasioned their advance in their specialties.

Returning our attention to the expression of the conception we will admit that to be true it must be consistent, not only internally with its various statements and definitions, but with demonstrable facts. It must be logical and desirable. It must be as lucid as possible, which is accomplished to a degree by premising no secondary "unknown causes" nor complicating the conception by having more attributes of the "first causes" than actually necessary to completeness.

Materialists and Monists will admit that we do not yet know all that may be known of Nature and its Laws. Idealists and Dualists will admit that we do not yet know all that may be known of God and His will. Each will admit that the other does know something.

Do not consider me presumptuous or lacking in appreciation of the work of others when I attempt to take these somethings which may be apprehended by one and not the other and form them together as one. I call it a synthetic philosophy; a conception new only in its synthecism.

Naturally the first thing to consider in a conception of Being is what is commonly spoken of as matter, that which composes the *things* of Nature. Idealists say, "Things are not what they seem." Materialists premise all phenomena on *matter*. Dualists make matter a result *external* to the *cause*. Monists say that the *cause* is *inherent*. These are various ways of conceiving matter, but they are not irreconcilable.

We say we know that matter exists because it has weight, but we assume it has weight because it is attracted. Then attraction *causes* weight. We say we know that matter exists because it is impenetrable, has density. But we assume it has density because it is attracted. Then attraction causes density. Matter has affinity; but affinity is only a specific name for attraction. Attraction causing weight we term gravitation. Attraction causing density we term cohesion. Attraction causing compounds we call affinity. There are other special ways in which attraction acts to which we give special names, but all are some form of attraction, and in all these numerous ways we say attraction is the power or cause of various phenomena in matter. In reality the most comprehensive definition of matter is this: "Matter is the manifestation of the power of attraction." This does not mean that attraction has the power to create matter, nor does it mean that attraction is the same as matter. It means that primarily there is a power and that matter is a manifestation of that power, but not necessarily that it is the only manifestation of that power. Now, all will admit the existence of power. Idealists may call it a Good Spirit, Nirvana, or any other name. Materialists may call it Attraction, First Cause, or any other name. Dualists may call it God, Deum, or any other name. Monists may call it the Ultimate, Absolute, or any other name.

We agree that there is a power. We will call it a Supreme Power because it is the greatest power. One side will admit that Attraction is the greatest power known, while the other side will assert that God is the greatest power. Even this difference in a name is a quibble. A definition of Attraction and Love may be

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the same, and "God is Love." Now I do not expect to bow my knee to the name of God, or Baal, or Nature, nor do I expect you to do so.

Let us start with A Power, or The Power, and you may presume that I mean any Deity that you prefer. You may suggest that it is not philosophic to start from the "unknown," but that which all *admit*, *must* be known. We all *admit* the existence of A Power. Also, we must admit there has been no known deviation of this Power, nor is it desirable that there ever should be any deviation; therefore, according to a previous statement, this is as near as we may come to an absolute truth. Then according to any standard of logic, nothing could be more positively known than the existence of The Power. Starting then from an *admitted* assumption, the existence of The Power, we will go a step farther in the conception of Being.

Admitting the existence of the Power, what is the next essential to a Being? or to a manifestation of that Power? It is Desire. Any manifestation of Power with no Desire would be chaos, but under any conception of Being chaos does not exist. One side says that Power is manifest according to the Law of Nature; the other side says that the manifestation is according to the Will of God. I say that the Desire of the Power is manifest in Being. The real meaning in each expression is the same, the wording simply showing that the conceptions differ. I think Desire is the most expressive word. Law seems to properly express the Materialistic idea of mechanical action. Will seems to properly express the Dualistic idea of exterior wisdom. Desire seems to properly express the conception of an intelligent spontaneous manifestation. The manifestation must come from the dictates of

Desire to the Power; or wording it differently, the manifestation is according to the dictates of the Desire of the Power.

Power and Desire are two different aspects of the One. There is no one word which expresses both aspects, so of necessity I use two; but always bear in mind that in the conception they are inseparable, one and the same. That I may sometimes refer to them as plural and sometimes as singular does not invalidate the conception, because nowhere is the idea of separateness necessitated. Power would be void without Desire. Desire would be impotent without Power.

Now we will take the third step. The Desire of the Power would be futile unless it were manifested. The Desire of the Power must be manifested to be perfected. If a Supreme Power had a Desire, there would be nothing to prevent a manifestation of that Desire. Its manifestation or materialization following of necessity would be an integral part. Therefore, the Power, the Desire, and the Materialization are One. It is difficult to conceive of either as separate from the other.

Scientists speak of "the forces of Nature," "the Law of Nature," and the material in which Nature is manifest; each a different aspect of Nature, but an essential and inseparable part of Nature. The Power of Being, the Desire for Being, and the Manifestation as Being express exactly the same thing.

Theologians speak of the Power of God; and the Spirit of God, or the Holy Ghost; and the Son of God, or God made manifest in the flesh. They speak of them as "Three in one, the same and inseparable," "The mysterious Trinity." It is a mystery so far as the Trinity of Nature is a mystery, so far as Being is a mystery, so far as anything beyond our actual com-

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prehension is a mystery. Yet it is as simple as any fact of metaphysics.

Every conception of Being must contain in some form these three elemental ideas: Power, Desire, Manifestation. The triune aspect of the One.

Being, as a whole or in part, or any phase of Being, is the Materialization or the Manifestation of Power, presupposing Desire which occasions it to be as it is; or we may conceive Being as the Materialization or Manifestation of Desire, which presupposes the Power to be what it is.

So far, I expect the reader to agree with me, of course, with mental reservation as to the construction he will put on the language. I admit that the statement, "Being is the Manifestation of Power and Desire," is not absolutely definite. It might be Idealistic or Materialistic, as one chose to interpret the language.

I do not wish by being too definite to awaken antagonism in the beginning, but I wish to emphasize the fact that this conception is that of a human being, and stated in language that is to be taken literally and it is given in words as definite as I am able to find.

As *human beings* we claim to be conscious and have a degree of intelligence. As *Beings* we are a part of the Manifestation of the Power and Desire.

Now right here is where my readers are going to fly off at a tangent, just because I am going to be a little more specific in my definitions. And they will depart, some one way and some another. Yes, I mean that every particle of Being is a manifestation of that Power and that Desire. I do not mean that God through His Power and according to His Desire created us out of nothing and wound up the Being of the Universe and after that remained a mere passive spectator. Nor do

I mean that pre-existent material was set in motion by some unknown Power and according to an Absolute (but unconscious and therefore unintelligent) Law we have developed to our present conscious state. I mean that I, as a human being, form my conception of the Power and Desire from its manifestations.

I am conscious, I could not act intelligently unless I were conscious. The Power could not act on impulse from the Desire unless it were conscious of that Desire. The Desire could not dictate an act unless it were conscious of that Power. So, I say, the Power and Desire are conscious or self-conscious, if such a word is more expressive.

A continued consciousness is memory. This is necessary for what we call experience. We see actions of manifestations which are not the result of the experience of that specific part of that manifestation, and therefore we are forced to conclude that the experience is from the memory of the Power and Desire. (This statement will be illustrated farther on.)

One other attribute must be admitted, unless we suppose Being to be the result of mechanical and automatic movement (in which case consciousness and memory would be useless), and that attribute is Volition.

Consciousness, memory, and volition are not creations of the Power, but are attributes of the Power. Each one of these attributes will be considered more fully in other chapters.

"I" am an individual. That statement sounds simple and I hear no protest. But I must try to define my meaning. First, the meaning of "individual"; I use the word in its primary meaning, single, one, indivisible. According to this definition "I" cannot mean only the objective human being, for that is divis-

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ible. It does not. "I" in this case means the individual who is conscious as an individual, who has memory and volition; the Ego; an atom, often conceived as the Soul. This is a statement with which some will agree and some will not. But in any case it is incapable of proof or disproof. Science accepts the atomic theory, but it is not proven. There has been some controversy, but here I think the acceptance of the definition of terms would stop the controversy.

✓ The definition I take is, "An atom is the smallest division of matter." We all admit that matter is divisible. Take a division we call a tree. We can divide it until it ceases to be a tree, but it is a tree unto the smallest division which contains its characteristic form. A subdivision of this would be a piece of wood. This can be divided until it ceases to be wood, but it continues to be wood down to the smallest piece that can retain its characteristic fibre. It then becomes organic substance, which under frequent division it continues to be until it loses its characteristic features. Still it is a particle of material. This may be theoretically divided into molecules. A molecule is the smallest particle of matter which can maintain its character as a compound. There might be one molecule of water but if this were divided it would cease to be water. Theoretically there is no point at which division must cease, but practically there must be such a point or matter would be homogenous, which it demonstrably is not. Instead of saying, "All matter is infinitely divided," it seems more lucid to say, "Matter is divided into particles of undefinable limits, which particles we call atoms."

If, under the Supreme Power and Desire, there are limits to the division of matter (although these limits

are to us indefinite), and these limits have not been transcended, then we can presume to say logically that the smallest divisions are indivisible, which they must be, as no greater Power exists to transcend the limits.

Approaching this differently we might say, "The atom is the primary materialization of the Power and Desire"; or we might say, "The atoms are the elements of the matter which is the manifestation of the Power and Desire." These atoms are sometimes called "Centres of force," or "Power centralized." (A certain theory as to the construction of matter has brought into use the terms ions and electrons, which are called smaller divisions of matter than atoms, which is contrary to our definition of atom, but this will be referred to later.)

I have said that the Supreme Power dictated by Desire is manifested in material Being. As a whole we might call this the Supreme Being, or the Universe. I have premised that it is atomic in structure and its attributes are consciousness, memory, and volition.

I will limit my terms here by an illustration. I have spoken of myself as a human being, also as an Ego. As a human being, because I have being or a body; and as a "human" in contradistinction to other beings. I spoke of myself as an Ego, because I believe I have a consciousness, memory, and volition, which observation teaches me is not possessed by the *body* as a separate being.

As a human being I am composed of a physical part, a mental part, and a material part. My physical power cannot be known until it is shown. My mental power cannot be known until it is displayed. It is through the material body that these powers are de-

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monstrated. Let the combination cease and there are no physical or mental powers visible. The material body is no longer called a *human being*. The physical and mental powers are wholly spiritual and can be manifested only through the material. The Power and Desire are spiritual, but are manifested to us only as objective Being.

You may say if the Ego is conscious, with memory and volition, why do not these attributes continue after separation from the body. I suppose they do, but to be frank I will say that I know nothing about that. My conception of Being is wholly from the standpoint of a being of which the body is an essential part, and which gives the ability to comprehend, to recollect, and to display will. The assumption I wish to make is that my consciousness, memory, and volition as a human being are attributes of the Ego, and not of the body. You may think the parts cannot have attributes which are not possessed by the whole, but they can. A specific form may have attributes, which are the cause of the characteristics of that special thing. The mass may have attributes not in any way possessed by the parts. Let us take a mass of matter; we say this matter is a manifestation of Power according to a certain Desire. (This idea of matter will be much modified as we progress.) This mass we see is dense and soft and ductile. We may call this "Gold." Do we mean that the Power is dense, the Desire soft, and each atom ductile? No, we mean that the Desire of that specific part of the Power causes it to manifest itself in that form and the characteristics of *that form* are its attributes, which differentiate it from other forms or manifestations.

Conditions being the same, the manifestation is

always the same. So firmly do we believe this that if at any time the manifestation is different, we say the conditions are not the same, rather than that the Power or Desire has changed; or as it is commonly stated, "Rather than that there was any change in the energy or matter, or the laws governing them." The theory of conservation of energy and the indestructibility of matter premise the same thing.

If the Power and the amount of Power does not change, what makes any change? I said that conditions change. What are conditions? Conditions are the relations between the various manifestations of the Power and Desire. Power is limited and unchangeable. Theologians say that God is the same yesterday, to-day, and forever. Desire is unlimited excepting that its satisfaction requires time, and for its fulfilment requires eternity. When I say that Power is limited, I do not mean that the Supreme Power has measurable limits, but that an atom is the manifestation of a definite amount of Power, which is not changeable. What all the desires or the future desires of these atoms may be we have no way of knowing. Our individual desires cannot be known to another unless they are in some way expressed. We ourselves do not know what desires we may have in the future. A definite Power and an indefinite Desire necessitates change in manifestation. If there is a change, there is a difference in the relation of the various parts and as this relation is condition, we say that conditions change. The modifier of this change is time. The change of the relation of certain of the manifestations are so regular that we have used them to measure time and designated it as consisting of days and years, but these terms simply express the specific changes of relation between certain specific manifestations.

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Exception is taken to the conception that Power and Desire are one and the same, yet Power may be limited and Desire unlimited. If we suppose the *mass* of the Universe unchangeable, it of necessity follows that it is limited to that mass. We know there *is change* and if change continues throughout eternity, it is of necessity unlimited. The *change* I conceive is according to Desire.

"God is unchangeable." "Matter is uncreatable." "Power is limited." All are equivalent expressions according to the various conceptions. Saying that Power, as the physical aspect of Being, is limited; and Desire, as the psychical aspect of Being, is unlimited, I do not believe involves an inconsistency in the conception.

The rapidity of this change is limited, therefore, when I say, "Desire is limited by time"; it is a quantitative limit, which merges it into the physical aspect. As the prolongation of time is unlimited the qualitative, varieties of change, is unlimited.

Nature and God are recognized by the Materialist and Dualist as being both limited and unlimited, and this involves no more contradiction than the assumption that an imaginary line is both limited and unlimited. It is limited or unchangeable in its width and unlimited or changeable in its length.

Conditions change, but to what degree they are changeable is a question. Scientists say that conditions are absolute, that all change is according to an absolute law and requires a definite time, and that every event is absolutely fixed by cause and effect. Theologians say that God is Omnipotent and Omniscient. I think neither conception is entirely correct and will take up this point later. I said that the particles of gold are a

manifestation of a definite amount of Power, and that it is manifest in that way on account of the Desire of its atoms, and that Power and Desire are conscious. But I do not mean that the *gold* is conscious. Nor do I mean that the Desire of those special atoms which are manifest as gold is entirely fulfilled by such manifestation.

The fulfilment of Desire is necessarily limited by conditions which I say are modified by time. Conditions may also show another relation which is measured by space. The spatial relation limits the Power. Only a certain amount of Power can be contained in a certain space. This is referred to as the "impenetrability of matter." If a certain amount of Power is moved through space, it does not change in amount (mass), but the conditions being changed, its relation (weight), may be changed. Cohesion is a term which also describes Power under certain conditions.

In my conception of Being I consider in its various relations that time and space are as absolute measures as mathematical measures are. That there is anything Unconditioned or Omnipotent in the superlative sense is a mere assertion which I do not feel compelled to believe.

When I say that Power is limited by space and Desire is limited by time, I do not mean that space and time are entities or that they are a sort of mysterious abstraction. I might say that Power and Desire are self-limited in their manifestation, which limitation we perceive as space and time. The forms of the manifestations of Power and Desire are dependent upon these conditions. What the bounds of these conditions are is a study of metaphysics and psychology, no less

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than of physics and physiology. The *correct* conceptions of Being will be of prime importance in a knowledge of conditions on which depends our future development.

CHAPTER VI

CONSCIOUSNESS

PHYSIOLOGIST and psychologist have made every endeavor to show that consciousness is in some degree the result of energy, but with no success.

I will make no effort to explain consciousness, although the condition expressed by the word is one of such great importance. I will say, though, that my meaning of the word is the most simple. I use it to express a condition absolutely passive. I do not mean any function similar to conscience.

In saying that consciousness is an attribute of the Ego, I do not mean that it is in any way different as an attribute of the Ego than as an attribute of the atom.

Consciousness is recognized as an essential to knowledge. Consciousness seems to be ability to receive and cognize impressions. Primarily impressions are from atomic movements, but in material manifestations, original impulses must be from mechanical causes in some cases; that is, the impressions are caused by movements of the material. If we knew how such impressions were transferred to the Ego, that is, how the molecular vibrations could be transmitted and translated so that the Ego as an atom could cognize the meaning of the original impulse, we might then comprehend the interpretations as a mechanical move-

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ment. We might also be able to demonstrate, if there is any, the difference between the atom and the Ego. Each responds to exterior impressions; therefore, each must have consciousness; each is influenced by experience; therefore, each must have memory. It is impossible to demonstrate that consciousness in one is different from consciousness in the other. But one knows so much more than the other, you say. Well, an intelligent man knows much more than an illiterate man, but we would not say that he had more consciousness.

I do not think that the word consciousness should be made to bear the meaning of comprehension. It is frequently so used, as when we speak of an insane man being unconscious of his deeds. The real meaning is that he does not comprehend or realize the meaning of his deeds. If an arm is paralyzed, we are not conscious of any feeling in that arm; we do not really mean that consciousness is effected, but that the connecting link between the arm and consciousness is broken so that consciousness receives no impression from the arm. In all probability this is the exact condition in any portion of the body when reference is made to loss of consciousness. It is, instead, the loss of one or more of the connecting links from sensation to consciousness. The brain is the machinery of transmission as well as of comprehension, and when this machine is diseased or broken, of course consciousness is not aware of the original impulses, sensual or mental, that may occur. Consciousness is passive and cognizes only that which is transmitted to it, and recognizes only that which is interpreted to it.

We naturally say that we are conscious of many things that we do not comprehend. We may be conscious of

impressions, the meaning of which we do not comprehend, but when we are conscious that we do not comprehend certain things, this is the result of a mental impression, which means that our experience has not been wide enough, and, therefore, in the memory there is not the necessary material with which to properly relate this new impression so that it can be comprehended. To put it in another way: we are not conscious of the special meaning of the thing which we do not comprehend, any more than we are conscious of a black spot. We may be conscious of the light around the black spot and conscious of the absence of the light at that spot, but if it is absolutely black, we receive absolutely no impression from it. We are conscious of there being certain places we cannot see and we call them black or blank. So of the mental impressions of ideas; we know there are parts that we cannot properly relate, and therefore we say we cannot comprehend, but in reality it is on account of some part being absent, and not on account of that which is present, that we do not comprehend. We may also be conscious of impressions, and these impressions become a part of memory, but by our inability to recollect and properly relate we may fail to comprehend.

I wish to point out more clearly as I proceed that my ideas of consciousness and memory are different from my ideas of comprehension and recollection.

The chief sentient atom of a microbe may be just as conscious as the Ego of a man, limited only in the quantity and variety of impressions of which it may be conscious. A microbe may have no mental impression. Their impressions may be wholly physical or sensual. To that degree, the channels of impressions being less, their experience would be less, their comprehension

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would be less, and the microbe would be conscious of less. But that is no evidence that the microbe is less conscious or has a different kind of consciousness.

Biologists generally admit that all living organic forms are conscious to some degree. But how of the inorganic? If it is admitted that the motion of the atom in chemical affinity is spontaneous instead of mechanical; that is equal to saying that it is conscious of an impression, and if it responds in the same way repeatedly under the same conditions, that would show that it must have memory. If the organic contains no new or different elements from the inorganic, then these inorganic atoms possess memory, because it is only through the experience of association and organization that they collectively increase in comprehension, and are able to manifest themselves in higher forms.

If I am unable to define my own consciousness, I certainly am unable to define the consciousness of the atom. There is one essential difference, which I wish to emphasize, not regarding consciousness itself, but the way in which it is impressed. We are forced to view matter as of two planes: the material and the spiritual. *The single atom is not material, it is spiritual*; that is, it is simply a definite amount of Power, and the Power alone would be absolutely immaterial. I can give no other name to it but spiritual, though I do not mean spiritual in any religious sense. The atom is a definite amount of the attractive Power and has a definite relation to other atoms according to conditions of location or motion. The varied impressions of the atom is the Power of attraction in its varied forms on account of these varied conditions. The response to these impressions (to be modified and described farther on) give us the material. The atoms aggregating take form,

i.e., become materialized from the spiritual on account of this response to the varied kinds of impressions. I will designate the cognizance of these primary impressions by the atom as being conscious on the spiritual plane. By this statement I do not mean that a chair is conscious that I am sitting on it, any more than I mean that my thumb nail is conscious of what I am writing. Premising that the *atoms* are conscious is *totally different* from stating that the material is conscious. The inorganic atoms (the atoms unorganized) are not conscious on the material plane (*i.e.*, material is not conscious). One of the errors of Materialism is in assuming that *matter* under certain *forms* may be conscious, as in the brain. They assume that as we are conscious, it must be some *material* portion of the person that is conscious. There is absolutely no proof that consciousness is *created* either as a result of motion or form, which is the Monistic idea; or that it is a physical product due to a peculiar combination of matter, which is the idea of some Materialists.

It is true that we are conscious on the material plane and it is also true that within the accepted meaning of the word we are conscious as human beings, *only* on the material plane. To be in touch with other atoms the Ego would necessarily be conscious on the spiritual plane as well as on the material and it seems paradoxical that we do not know it.

According to any hypothesis which admits of matter, we know that each atom of our body is compelled to respond at some period to energy, but of none of the various forms, such as cohesion, chemical affinity, etc., are we directly conscious. It would be acceptable to me to call all this certain class of impressions the "subconscious," if it is not understood thereby to be a

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different kind of consciousness. I believe that consciousness is one and the same anywhere, but that ours (the consciousness of the Ego of a human being) is fixed along or is impressed through certain channels of attention and comprehension. The Ego is the chief conscious atom in the body, which body is fitted to direct and interpret to the Ego a certain class of impressions which are different or differently translated than those ordinarily impressing the atoms. These are material impressions, and not only material impressions but a very limited class of the material impressions. These impressions are not necessarily mechanical or measurable but are perceived as designating material origin. It is pretty generally admitted that different sense impressions arise from the different rates of vibration, by which the nerve termini are stimulated. One set of nerves respond to rates of vibration within certain limits and another set respond to vibrations within other limits, but outside of these limits in either direction are rates of vibration to which they cannot directly respond. We, then, as human beings, are limited as to the openings by which consciousness can be reached, and of these openings five only are within the field of our consciousness, and of this field we are more or less limited by our attention and comprehension. Should any impression come to consciousness through any other opening, it must, to be recognizable, be translated in terms of the vibrations which enter at one of the five openings. That is, nothing is sensible, no matter how it may be received or perceived, unless it can be translated into the terms of one of the five senses. This is our limitation as a human being, and I do not believe it has been transcended, nor do I believe that it is necessary or

desirable that it should be to perfect the existence of human beings.

Some speak of thought transference, clairvoyance, or various other phenomena as a sixth sense, but it is no more so than wireless telegraphy. A variation of impression does not mean a variation of the senses. I admit the *possibility* of a sixth sense, but it would be absolutely useless unless it could be translated into terms which are at present sensible, and if that could be done, there would be no use for it anyhow. In other words, a sixth sense is of no use until there is a use for it. So far we have not reached near the limit of usefulness of our present senses. That is, there is much to be learned yet which lies within the scope of our five senses if we will use them.

In limiting the human to five senses I mean the use of them as means of interpretation of impressions on the material plane. I believe introspection or the reception of impressions through the spiritual plane which may be interpreted into sensible terms is a possibility; not only a possibility but a probability which offers the greatest chance for the mental and spiritual development of the human race. I believe it is these introspective impressions which give the aspirations and inspirations to humanity.

Psychic investigation shows that many give voice to impressions that apparently did not obtain access to the consciousness through exterior sources, but so in dreams we are conscious of ideas which so far as we know had no origin in the world of reality. It may be an open question whether or not all these mental phenomena originate in the brain solely. I believe the Ego may be conscious of much on the spiritual plane that might be translated to the material plane, if the

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brain was rightly developed and our attention was right. I think ordinarily the right combination is not obtained. Men of good brain development force themselves to confine their attention to what is called sensible and practical things. Comparatively few scientists are found willing to even investigate psychic phenomena. On the other side, a person with a brain predisposed to receive psychic impressions, has a brain comparatively undeveloped, or at least unevenly developed and unfit to comprehend and translate any but the most common place impressions, which may as well have had any other origin.

In order to show what I mean by my use of the words transmitting, translating, and interpreting, I will use an illustration.

An army general, incapacitated from being present on the field of manœuvres, dictates to his stenographer the orders of the day. The short-hand notes are transcribed to the typewritten page and given to a telegraph operator, who wires the orders to the city near the camp. The operator there telephones the orders out to the colonel at camp headquarters. A member of the staff writes down the orders and gives them to the band master, who translates them into symbols for the buglers, who, when the time comes, interprets them into vibrations which are understood by horse and man.

Notice particularly in what a variety of forms this order consecutively exists. As an idea, vocal vibration, air vibration, short-hand symbols, typewritten, electric vibrations, metallic dots and dashes, vibrations of telephone receiver and transmitter, script written, musical bars, musical metallic vibrations, auricular vibration, sensual impressions, motor impressions. What a vast difference! Many of these forms, as mani-

fested, are utterly unintelligible to certain of the links in this chain of communication. Some of the links transmitting mechanically, some spontaneously; some interpreting, some translating. There is absolutely no physical resemblance between the typewritten page and the electric vibrations; no grounds of material comparison between the idea and the bugle call. Yet through all these changeable forms the order is transmitted and the idea is finally formulated in the manoeuvres.

This wonderful process of communication has gradually grown possible through intelligent use of experience. The spontaneous links of the chain are intelligent stations capable of translating and transmitting the orders. Any one of these might not be able to *comprehend* the meaning of the order. The work in this connection may be to a great degree automatic and enter to but a small degree into the conscious life of the actors, but yet consciousness, memory, and intelligence are primarily necessary to the transmission of the order by that special link in the chain.

I will here define my meaning of the words "mechanical," "spontaneous," and "automatic." A mechanical movement is one executed wholly on account of exterior pressure or forces, as a ball thrown up in the air; a spontaneous movement is one executed from inherent power, or associated force, as a ball falling to the earth; an automatic movement, as applied to animate beings, is one that through force of habit is executed without special thought or attention. An automatic machine is one working without special thought or attention on the part of an attendant, or a movement without special attention.

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In the various forms of the general's order in the illustration, one may see each of these kinds of movement, singly or in combination.

As wonderfully diverse as are the processes through which the general's order goes, as given in the illustration, there is no reason to doubt that the message in its passage through a man from the exterior physical impressions to the consciousness of the Ego undergoes equally as wonderful and diverse processes.

I wish to draw from this illustration one other analogy to point the comparison. As we see the troops of cavalry respond to the bugle calls, it apparently is a movement as of one body. A perfect response to the order would give the observer no reason to think that each separate entity received the order and obeyed spontaneously as separate entities, yet we know that it is through the personal consciousness of not only the men, but the horses as well, that a perfect evolution is performed. And the nearer perfect the evolution, the more nearly automatic it is apt to be. Primarily the attention was required. The movements in the illustration being quite artificial and special, it required much training to make them automatic, but in movements that through generations become to a degree natural, a proportionately less time is required for the motion to become automatic. We see this in the special adaptability of men and animals for kinds of work that had been performed by their ancestors.

If we watch a flock of certain kinds of birds in their flight, or a school of fish, we shall see a response to impressions or orders that give evolutions in which the accuracy and simultaneousness of the manoeuvres have never been approached by any body of men, however much they may have been trained to act together.

These movements are primarily spontaneous, but to a great degree are automatic; however, previously there must have been conscious attention and to a certain degree there must still be a consciousness of impressions. Even in this material fact, which any one may witness, we do not know how or by whom the impulse is given, how it is transmitted, or how it is received and translated in order to give such a simultaneous movement of separate bodies. It is not from the training or experience of these specific bodies, for minute minnows show as wonderful accuracy in the spacing and actions of their manœuvres as a school of older fish.

A muscle of the body in response to stimulus acts as a whole and is ordinarily thought of as a simple thing. It is supposed that when poked with a nerve, the muscle jumps, just as a frog jumps, when poked with a stick. This apparently is a simple action but it is not quite so simple as it seems. The muscle is not one solid entity, it is composed of tissue, and the tissue is composed of cells, and the cells are composed of molecules, which are in turn made up of atoms. Not only is it the muscle that acts; it is the tissue that acts, and not only the tissue but the cells of which the tissue is composed, each spontaneously performing its part. This much can be demonstrated. Is it illogical or unreasonable to say the motion must primarily be carried back to the molecule and the atom? If it is so carried, then the atom or the individual is where the consciousness lies. These atoms move with a certain form, composing the molecules, and these combine to form material, and these combine to form cells, and these combine to form tissue, and these combine to form muscle or sinew or bone or brain, but it is not the molecule or any of its combinations, even the brain, that is conscious, any

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more than it is the company of soldiers of the regiment that is conscious. It is the individuals of which the regiment is composed that are conscious. And the individual would not mean the body of the soldier. In neither tooth or toe nail or any other part of the body is the Ego conscious.

But it takes more than an Ego to make a human being, just as much as it takes more than a general to make an army. It takes more to constitute what we mean by an army than even all the persons which compose the army. The personal constituents of a mob might be exactly the same as those of the army. The difference is that one is organized and the other is not. This organization is not wholly the work of the general. The organization may have been practically perfected before the general was appointed, and to a degree the movements may be independent of the general, that is, the movements may be in accordance to general orders instead of a general. So also the units that compose the body are the same units that exist in earth and air, but in the animate beings they are organized.

Not only in the organic forms do we see organization; every snowflake shows an organized movement more accurate even than the movements of the army, the school of fish, or the muscle. There is absolutely no physical reason why a snowflake should be always the same in certain features, and always different in other features. There is no physical reason why the forms of coral should vary, not in an irregular or disorderly way, but always within definite limits, and always under certain conditions with a certain kind of variation. Why should some polyps build up bone coral and others build up brain coral? The snowflake and coral

show the result of organization of movement as much as the bone and brain of man show the results of organization. Under no other hypothesis than the consciousness of the atom can we account for organization of the atoms, excepting on the hypothesis that there is an exterior power which mechanically forces them to take the various forms. By the latter hypothesis we not only remove the cause one degree, but must have an hypothesis as to how the force can act mechanically on the atom if the atom is inert.

By the hypothesis that the atom is the Power, the materialization is its action. By the hypothesis that it is conscious and spontaneous in its action, then, *as conditions permit*, without anything other than inherent Desire, these atoms can organize in special forms. The lower of these forms we call simply material; the next higher degree, so to speak, we call crystallization; the next higher form is the organic, of which form man is the highest representative. (Higher here is meant to convey the idea of complex.)

Materialists agree that man is the highest organic form of matter, but say this form grew according to an absolute law, which is inanimate and without consciousness or intelligence.

Dualists agree that man is the highest organic form of matter, but say that the essential part of man is not the matter but the soul or spirit that is placed in the material body by another spirit, called God, who created the body as a receptacle of the soul.

The Monists agree that man is the highest organic form of matter, but say that this form arose from the spontaneous combination of its units, and that the law is only a description of the action of these units; that not only is the form called man created in this way,

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but the attributes we see connected with man, such as consciousness, memory, and volition, are the necessary accompaniments of this form, but exist only on account of the form and have no existence excepting only as the form exists. When the form is destroyed, the accompaniments, consciousness, memory, and volition are also destroyed.

My hypothesis differs from that of the Materialists by premising primarily the existence of consciousness and intelligence. I agree with the Monists' definition of "law," that the actions of the material in creating the forms, and the relations of these forms, are not *made according* to or by a law, but that the law is a statement of the manner or method of creation of these forms and relations. I do not believe with the Dualists that all the consciousness and intelligence is in a spirit separable from that which is manifest in the various forms of Being. I do not agree with the Monists that consciousness is a creation and condition dependent on form and that there is no intelligence superior to that which we collectively as human beings can and do comprehend. My hypothesis is that the Universal Power is conscious and intelligent; that each part (*i. e.*, atom or unit) is conscious and intelligent, but, as parts cannot each be equal to the whole, so no atom or Ego is equal in intelligence to the whole. On the other hand, I believe the whole is no greater than all of its parts collectively and organically, and each part is as essential to the whole, *proportionately*, as the whole is to the part.

I wish to emphasize the distinction between Power as definite in the atoms, and the forms in which the atoms are manifested as material body. A human being is a "form," and I do not believe any specific form or body

is at all essential; that is, that a specific human form is of necessity of any more importance than a specific tree. Each form is important only as it performs its part in a more complex or higher organization. The Ego is an essential part, but I do not know that the Ego is primarily designed for or delegated to a more prominent part than any other atom.

Materialists deny the existence of an Ego. Dualists admit its existence, but say it is in essence essentially different from the atoms of the body. Monists say that "form" creates the Ego. I say the Ego exists, is of the same essence (essentially the same) as the atoms which compose the body, and is different only in that it is the general of the form of atoms composing the body and to a degree responsible for the action of this body. I do not believe that the relation of the Ego to the body is the same in each body. The body is not necessarily organized by the Ego. The body is the result of the efforts of the atoms to organize, influenced by a Desire of which they are conscious, but which they may not comprehend. The existence of the Ego is stated only as a premise. There is no way of demonstrating its existence. It is a fact of consciousness that I exist, but only a premise that I, in my consciousness, am an indivisible unit. When a Materialist sees that the existence of this special *unit* cannot be demonstrated, when he demonstrates the result of consciousness as existent in various portions of the body, when he shows that the ganglia have proportionately all the attributes of the brain; it is natural for him to conclude that the soul is a myth. He fails to demonstrate that consciousness is material, but he does not consistently say that consciousness also is a myth, but says that, not being material, it is not within his sphere of operations, and

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simply classifies it with the unexplained phenomena of nature. I take it as a fact of consciousness that I exist, and when I say "I" here, I do not mean my body or my person, but an indivisible entity. I do not think that I am a combination of several entities. I may not always be of a single mind, and I may be divided in my purpose, but I say this is the result of different exterior impulses. The other atoms of the body have desires which strive for fulfilment. In the orthodox expression, the spirit is at war with the flesh and the devil.

Granting the existence of an Ego, at what stage of the organization did the Ego become related to the body? I do not know, do you? The majority of people in this world believe that there is a soul, or spirit, in the body. If any one of them will give a consistent and reasonable explanation of when and how it got there, I am content to accept such an explanation. I have no idea whether the Ego is primarily in the male or female, or whether it is inspired with the first breath of life. I know of but three ways or reasons by which one atom may occupy a position different from another atom: through one of the various Desires which are inherent in, and animate the atoms, through opportunity, or, through volition.

The Desires, which are given expression in the elements, seem fixed and their opportunities are limited. If volition exists at all, which cannot be demonstrated, we do not know how far it can effect opportunity. If condition is the only thing which governs, then the Materialistic hypothesis would be correct. If it is impossible for any one to demonstrate that the Ego, or man, can change conditions, that he has a Desire other than that imposed by environment, or that he has

volition except in his imagination, then it is certainly useless to try to demonstrate that the Ego has an influence or even any use in the body in its early stages. I suppose it is there, but I do not know it for a fact. The earliest point at which the presence of the Ego seems to be essential is when such impressions are made that will be necessary, as experience, to a future acquisition of knowledge and comprehension.

For experience, knowledge, and comprehension, memory is necessary. As part of my hypothesis memory is also an attribute of the Ego.

CHAPTER VII

MEMORY

THERE is no knowledge as to what constitutes the mechanism of memory. It is a general supposition that the brain in some way is a storehouse for sensation and ideas, and that by certain stimulus reproduces them to the consciousness.

A ball may have a great variety of motions at one and the same time, or rather its motion may be varied from a simple one to an intricate one, as the result of many different causes. Given sufficient data, that is, the necessary machinery of calculation, and we could translate these effects of motion back into their several causes. Some liken the motions to the memory, and the translation of these motions to the recollection. No physiologist supposes that for each sensation there is created a new brain cell or convolution. There is nothing to show that those possessing great memory or power of recollection have a larger brain, or one with any more convolutions than that of another person equal in intellectual development. Certainly the power of recollection is not at all in proportion to the degree of intelligence, that is, a person cannot accurately predicate the one from the other.

If memory is the result of machinery, it is so refined that no physicist has even given any adequate hypothe-

sis of its formation. Many authorities believe that it must in some way be a form of motion preserved by the various brain particles, as in the illustration of the ball, but even so, the numerous details of the memory would necessitate a refinement of motion so great that the chemical change necessary for nutrition, the capillary influence necessary in the circulation, the ordinary changes of temperature, etc., would have far more influence on the motion of the various molecules of the brain than the energy left by a sensual impression.

If a refinement of sensation, a sub-material condition, is essential to account for memory, why limit it to the general matter of the brain? Why not let memory also be translated back as an attribute of the Ego?

It is just as easy to talk of the pigeon-holes of the brain as it is to imagine the pigeon-holes of a desk, but when we get down to a consistent analysis of the hypothesis, we find that whether we consider it as a mechanism or the motion of a mechanism or a material entity, as a matter of fact memory has become unmeasurable, that is, the method of memory or recollection is beyond our comprehension. At least, not having heard of any one who pretends to actually comprehend how memory is effected or caused, I take it for granted that it is not known, and therefore suggest that this being the case, it is reasonable and permissible to call the Ego the seat of memory.

If the energy of the brain cells constituted memory, then drawing on this energy for a recollection would in time exhaust it, but the contrary is true. The more frequently we recollect a thing, the more vivid it appears to our consciousness. Now if the Ego is the seat of memory, and the brain the machinery of recollection, that hypothesis would be consistent with the known

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operations of the body, for the more frequently a muscle is used the stronger it is. Of course, I do not mean that the brain acts as a whole as a muscular action. Athletes who are good walkers, runners, jumpers, or bicycle riders have their leg muscles well developed, but one who may excel in jumping does not necessarily have the ability to excel in running, but a development of a special set of muscle will cause development to a certain extent of the related muscles. This is so with the reproducing¹ faculties. As the leg muscles may be developed without a corresponding development of the arm muscles, so the reproductive organs used in the recollection of a certain class of sense impressions may be well developed and others poorly developed. Muscles of one person may respond quickly, those of another strongly, while another persons may show great endurance, etc. The same difference is noticeable in the faculty of recollection. Brain as a reproductive organ is analogous to muscle, but brain as a *storehouse* is not.

Memory is a retention of conscious impressions. Recollection is the reflux of consciousness, and consciousness is limited by comprehension. A dog can see a beautiful picture and not comprehend it, but it is not a picture to the dog, it is an object. He comprehends that this object is not good to eat and it awakens no impression of appetite in his consciousness. The degree to which the picture would appeal to our consciousness would be just the degree of our comprehension. Consciousness and comprehension are frequently

¹ There is no authority for the use of the terms "reproducing" and "reproduction" in this connection, but no other words seem able to convey the intended meaning that recollection is a reproduction of memory to consciousness on the material plane.

erroneously used as synonymous terms. Memory and the power of recollection are also erroneously used synonymously. The Ego is surrounded by the machinery (sense-organs and brain) for translating sensations to its consciousness, and for reproducing them (the stored perceptions) from memory.

As we grow in experience and the brain develops (machinery improves), we have a broader comprehension and to a certain extent we can recollect ideas of a more complex character. This is due to the machinery, *i. e.*, brain, which has its equivalent in any organization of atoms.

As the details of memory increase, the quality of that stored in memory may improve, that is, there may be an increased complexity of ideas and the Ego is conscious of a greater degree of comprehension.

The increased complexities of the perception stored in memory and the increased complexity of the machinery of comprehension and recollection may be *coexistent*, but they are not necessarily *coextensive*. According to my conception a specific spirit is no more unlimited in its extension than a specific particle. I assume that memory and the power of recollection are not the same. At least there are different processes; the retention of the impression and the reproduction of the impression. The retention of impression is spiritual and the reproduction of the impression is material.

We speak of a vivid impression being easily memorized, but the vivid impression is one that is frequently recurring to our consciousness. A startling scene or a bright idea is, especially in the period soon after the impression, reproduced a great many times. Other impressions may be reproduced fewer times, or even not at all. Now in the case of a frequent reproduction, as

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I have said before in the analogy of the muscle, that particular portion of the reproducing machinery is exercised.

Memory is constant while recollection is intermittent. Some might say that memory is potential recollection as energy is potential in the muscles. That is the illogical point. There is only a certain amount of energy potential in the muscle, and when that is exhausted, it must be replenished from sources other than the muscle itself. So if the brain were the storehouse, it would become in time exhausted.

A phonograph record may be called the material memory of a song. If this record were photographed and reduced to microscopic size, it would still be a memory, translated into a different form. There is no physical reason why as a reflex this photograph could not be enlarged, and by a process of electrotyping, produce a record similar to the original, then the song could be reproduced through sensation to the consciousness. This song so reproduced would be nearer like the original than a recollection of it reproduced by the brain from memory. The photograph as a memory is but a minute particle in comparison to the machinery necessary for the reproduction or recollection. It is true that in this illustration, which is mechanically possible, the memories, if sufficiently numerous, might equal or exceed in bulk the machinery of reproduction, but suppose it were possible to superimpose or photograph one record over another, on the same material, then there would be no increase in the bulk of memory. This refinement of impression might be abstractly carried to infinity. A wax or rubber record would ultimately become worn out, certainly the deterioration would be just in proportion to its use, while the opposite

is true of the photograph or of memory. Suppose we use this photograph as the illustration or analogy of memory. This photograph could be translated into a sound record an infinite number of times without any deterioration. The sound (wax or rubber) record and the phonograph could be likened to the brain, the reproducing machine. This might wear but could be renewed. Now taking into consideration the difference between a machine and an organism, the one deteriorates and the other improves by use (within recognized limits, of course), and our analogy is perfect. The hypothesis seems to be consistent with known facts. The seat of memory is comparatively an unchangeable entity, this I designate as the Ego. The organs of recollection are changeable entities, these I designate as the reproducing faculties or reproductive organs of the brain.

The substance of one photograph may be practically the same as the substance of another photograph, but the two may be translated in widely different ways. One might be reproduced, as we have said, through sound, another through sight, or a series of these sight photographs might be reproduced through a moving-picture machine, and it would appeal to our consciousness far more vividly than any mental recollection of a similar scene. The photographs might be intact, but if the machinery of reproduction should be injured or broken, we would fail to reproduce the original impression. The phonograph might be broken or impaired, so we could not reproduce sound, or at most imperfectly; there might be one of the records broken, and only that specific one would fail of a reproduction, but the failure to be able to perfectly reproduce any or all of the sound records might not impair the ability to operate the

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moving-picture machine. We know that a destruction of one part of the brain may effect the power of recollection of a certain class of sense impressions. A lesion of the brain may be so small as to effect only the power to recollect a certain specific word or object. Should a portion of the brain so large as to correspond to the phonograph of our illustration be destroyed, it is seldom or never repaired, but in a lesion, say small enough to compare to one of the wax records, there is frequently a recovery, as we hear often, "He has regained his memory of certain things that seemed to be lost." Now if the wax record was the ultimate record, it would be impossible ever to make another like it, in case it were broken. If a pigeon-hole in a desk, with its contents, were removed and destroyed, it would be impossible for it to grow in again. It would have to be replaced from exterior sources. So if a portion of the brain were removed and a specific memory destroyed it would be impossible ever to replace it, excepting as a similar impression should be given from an exterior source. Assuming that this specific portion of the brain was the ultimate record or memory of the specific idea or impression, it would be impossible to reproduce this on account of its loss. But this is not the case. A repairing of a lesion or a fitting of another portion of the brain substance to act in the place of the lost part enables one to again become conscious of the same idea or impression, which seems to show that the memory of it must have had a constant existence. On the material plane we are not conscious of memory but only of recollection.

Of memory itself I have no conception. If we saw a microscopic photograph of a song record, it would awaken no consciousness of a song or the singer; yet, in

all probability, there is much less physical resemblance between a memory, and that which is memorized, than between a singer with his song and a phonograph with its record.

In the illustration of the phonograph we can trace the energy through its various forms from a singer, song, recorder, receptacle, record, and refinement, to final photograph; then, the return action reproducing that which again gives us an impression of the song and a perception of the singer. But suppose a person wholly unfamiliar with this process observed it, he would not at all comprehend the method. He would most naturally say that the music was in the machine. In any process of metaphysical deduction would not the chances be very great against his hitting the correct sequence of operation? Suppose there should be an imperfect reproduction; would such a person be able to tell wherein lay the cause of the defect? Even an expert, did he not have access to the various parts of the machinery, might be unable to locate the trouble.

Most people are unfamiliar with the process of perception from impressions to memory and the reversion through recollection to consciousness again. Physiologist and psychologist are able in a certain degree to trace the process, and can often locate the cause of any imperfection or obstacle in the process, but the process itself, that is, how one form of energy can be interpreted into a corresponding form wholly different, is, thus far, beyond our comprehension.

Consciousness, memory, and volition, though apparently primarily the result of energy, yet are translated to such a refined degree that they are possessed of no measurable amount of energy; that is, they cannot be demonstrated as really material. Such being the case,

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it seems that it is a fair hypothesis to assume that consciousness and memory are attributes of the Ego.

The amount of which one may be conscious (which we might call the quality of consciousness, or complexity of consciousness), is due to and measured by comprehension. This comprehension comes from experience, memory being the accumulation of this experience. There is no apparent degree in consciousness. There are degrees in comprehension. A baby is not *less conscious* than an adult, but is *conscious of less*. It is necessary for an understanding of my hypothesis, to give due weight to this distinction.

A dog looking out of a window sees just as much as a man does, the field of vision being equal. The dog is just as conscious of what he sees as the man is; that is, he is just as conscious of the light impressions that strike the retina of his eye as the man is; but the man is conscious of much more than the sight sensation. He might be conscious of the relation of the vegetable to botany, of the animal to biology, of the landscape to geography, of the water to hydrography. These relations and numerous other relations and interrelations form mental impressions, which would be limited only by his comprehension. Without consciousness and memory there would be no comprehension.

We may memorize a verse of poetry when young; our consciousness of this might be limited to a mere knowledge of an aggregation of sound impressions. In later years, on recollecting the verse, we might comprehend its beauty and the ideas expressed; thereafter the memory would include the perception of the ideas involved as well as the sound impression. Though the verse is the same, there is much added to consciousness and memory regarding it, solely on account of compre-

hension. Now the brain seems to be the mechanism of comprehension of impressions and also the machinery of recollection.

Consciousness requires no mechanism, comprehension does; memory requires no machinery, recollection does. And the more complicated the machinery, the greater may be the comprehension and therefore the material for occasioning recollection.

The large yard of a railroad terminal is more than an aggregate of tracks. There are interlacing switches, and the more intricate this system of tracks and switches, the more rapidly can a train of cars be distributed or made up. The more intricate the convolution of the brain, the more systematically can varied impressions be properly related and co-ordinated, and a train of thought composing an idea can the more quickly be completed; that is, the more complicated the machine, the greater the amount of work, and the more diverse the *quality* of the work it may accomplish. Train yards, machines, or brains of equal capacity might not be used to their capacity. Volition and opportunity would effect the equation.

It may be suggested that certain inferior brains show comparatively greater powers of recollection. An illiterate may recite the whole Bible, name each of a thousand sheep, or describe various minute differences in vegetation. A philosopher might be able to do none of these things, and even be called so deficient in memory as to be absent-minded. But notice, the recollection of the illiterate is of a certain class of impressions; that is, the portions of the brain possibly that reproduce impressions of form are abnormally developed. The brain as a whole is not necessarily more intricate. The philosopher, while apparently

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absent-minded, may recollect a greater *variety* of mental impressions, and relate them in a greater variety of ways than the illiterate could possibly comprehend. Take any one who may be noted for an exceptionally good memory and you will find that his recollection is of a certain *allied* class of impressions.

The thinker develops his brain to reproduce mental impressions and generally to quite a noticeable extent there is lack of development of the part which reproduces objective impressions. On this account it is a common saying that philosophers are absent-minded and oblivious to their surroundings. Few realize that mental impressions and recollections are of a much more varied nature than sense impressions. And the more abstract, the more intricate the machinery necessary to recollect the material for a complete idea. I think from these illustrations it is obvious that the greater the power of recollection, the more intricate the machinery necessary; also that by the greater powers of recollection I mean not so much the quantity of a certain class of perceptions, as I do the *variety* of the classes of perceptions.

I wish to explain a little further what I mean by conscious impressions. The centre of our field of vision is the point upon which our eyes are focused. Objects near the edge of the field of vision are less impressive than those near the centre, but we do, to a degree, perceive them. The centre of our field of consciousness is the impression to which we are at that moment attentive. Other impressions which comprise this field are being made; some to which we give apparently no attention, that is, of which at that time we are apparently not conscious, are affixed in memory. Some relation later might cause these impressions to

be recollected, and we then realize that we were really conscious of the impression when made. Had we not been conscious of it, the relation could not have been made, and there would not have been any recollection of this impression. We are not immediately conscious on the material plane of all the Ego cognizes. It is only that which the brain is capable of re-cognizing (comprehending) that becomes conscious to the Ego on the material plane. This re-cognizing, recollecting, and relating are functions of the brain.

I speak of recollection and relation as though they were consecutive, while they apparently must be simultaneous, but I am not making the attempt to show the process of recollection; I am simply relating memory to recollection by assuming memory as constant and recollection as intermittent, the Ego as the seat of memory, and the brain as the seat or machinery of recollection.

The question may arise, Is memory perfect? I have nothing on which to arrive at a conclusion regarding that point. We might argue that no impression can ever be absolutely obliterated, as we hear some say that every impulse of energy goes on and on forever and cannot be lost; or, on the other side, we might say that as so many impressions are apparently useless and will never serve as a relation to any reasonable thing in the future, they will in process of time become extinct. It would seem that the constant increasing accumulation of impressions would prohibit a recollection of all of them at any future time. However, we do know from experience that the limits of memory have never been found, while the power of recollection is so limited as to be to us a constant source of trouble; therefore, why be troubled about the limits of memory, while the machinery of recollection is a sufficient cause of anxiety?

CHAPTER VIII

VOLITION

THERE is no other concept in metaphysics so wholly abstract and so lacking in definement as volition.

When I state as my hypothesis that volition is an attribute of the Ego, as also are consciousness and memory, I must limit it as to definition. That which makes the Ego conscious of more than the atom is the comprehension given through the aid of many atoms as organized in human beings in what we call the brain. This same brain serves to recall the conscious impressions of the past, which the Ego retains as memory. I do not define consciousness as the ability to comprehend. I do not define memory as the ability to recollect, nor do I define volition as the liberty of action. I do not define it as the motive or as the cause of action. I define consciousness as a passive cognizance of impressions. I define memory as a preservation of these impressions. I will define volition as the power to choose. In my conception as a human being I limited consciousness by comprehension; I limited memory by recollection; I limit volition by conditions.

When I define volition as the power to choose with the power limited by conditions, I am not describing volition nor giving it any new values. Some may say that this is no definition, but if any one cannot under-

stand my meaning and use of the word by this definition, a use of additional words would only serve to increase the misunderstanding, for each additional word would have to be defined, etc. It seems to me the use of the word in that sense is legitimate, not to say authoritative. Authoritative definitions might fill a volume. I will give in substance two or three to show that definitions may vary. One psychology says volition is the creation of a combination of desire, choice, and motive; and then, through many pages, shows how each is an essential part of volition. Another author is more concise. He says, "Volition is the power to will what we will." He does not say whether the second will is redundant or explanatory. One writer of magnificent accomplishment says, "It is puerile to say volition is the choice between two things," and then describes volition so as to make it synonymous with character. I might multiply indefinitely these definitions, but in all cases where there is any effort to be logical at all, the definitions are given with a view to making the explanations accord with the theory.

I must do the same way, as I use the term volition with a distinctive meaning. The way I use the word excludes the idea of will, which I believe to be a function of the brain. I would define will as the motor impulse following mental and physical desires, so far as we are conscious of them. Will is used as a synonym for desire as frequently as it is for volition. To obviate confusion, the term "free will" is often used, but this term only adds to the dilemma for this still may bear the definition of desire and convey the idea that we may be *free* to do as we desire.

My use of the term volition, as I define it, has no similarity to will as desire. When I use the word will

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in the superlative sense I mean the motor of a desire strong enough to overcome conflicting desires. I claim there is absolutely no will except as a motor for an exact equivalent desire, the consciousness of which desire may be of physical, mental, or spiritual origin.

Is there such a thing as power of choice? The actual point of this question is nearly always denied, contradicted, or evaded.

Let us see how my definition will be treated under the different conceptions of Being. Power of choice, limited by conditions, is an attribute of the Ego, which I call volition.

The Idealists admit it, but make the "conditions" so abstract that it causes no limitation. They say, "If you wish you can choose, and if you choose you can have faith, and if you have faith to believe, you can have such power as not to be subject to any material limitations." They worship the fetish, "The Unconditioned."

Materialists may admit the definition; then make conditions limit to such a degree as to eliminate choice. They, in effect, deny volition. Some deny it *in toto*, and say the law maker, the law breaker, and the law enforcer are all products of and parts of condition, and all alike irresponsible. Extreme Materialism is Fatalism. They worship the fetish, "Cause and effect."

Dualists admit and consent unqualifiedly to the definition, but in addition say: "There is an Omniscient Being, who knows all the conditions; therefore, knows what the choice will be." This is contradictory. First, they do not seem to realize that if conditions limit volition, then to a certain extent those conditions are modified by volition. Second, they do not seem to comprehend that if an Omniscient Being knows the exact

way I am to follow, and the exact deeds I am to do, I certainly can follow no other way and do no other deeds. To assert that Omniscience transcends logic is to say that it is useless to try to get a consistent conception of Being.

A preacher of great authority in a sermon showed that volition as "free will" was a law of nature, and "foreordination" the law of the gospel, and in summing up said: "Now, how do we reconcile these apparently contradictory facts? We do not try to reconcile them. Man being finite cannot comprehend infinity." Now, facts never contradict. Doctrines and theories may contradict, but facts are a part of truth, and truth is not contradictory. The Dualists worship the fetish, "Omniscience."

The Monists admit that there is a power of choice and that the limitations are not such as to amount to the fatalism of the Materialists. They substitute for fatalism the word "determinism." One of their writers of repute says: "There is a choice not influenced by compulsion, but all choice is influenced by something, desires, wishes, etc., and of necessity the stronger influence decides the choice." He says: "One must comprehend here the distinction between compulsion and necessity." To make it easier to comprehend, he illustrates by the needle of a compass. If the needle were to be moved by the finger, it would be compulsion, but when moved by attraction or magnetism, it moves of necessity. One is mechanical, by exterior force; and one is spontaneous, by interior power. This distinction is quite clear, but I fail to comprehend where the element of "choice" comes in. The Monists do not want to worship any fetish. They fear to admit of any unknowable element, as that would border on the super-

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natural and be a possible subject of worship, at least something incomprehensible to the human mind. To them there must be no attribute of power, but what can be plainly demonstrated as materializing according to some known cause, and no cause must there be that one must call infinite.

To say that volition is power to choose in spite of causes or contrary to causes is to *make* it the absurdity that it seems to many Materialists.

It is wholly impossible to demonstrate that there is "a power of choice." The more that we attempt to show that there is a volition in any degree unconditioned the more it seems like an absurd myth. To show logically that there is volition (*i. e.*, power of choice) we would have to show that conditions which should influence the choice are so evenly divided as to neutralize each other; practically that there are no causes remaining uncanceled which might influence the decision. This seems an unusual condition, yet in the infinite variety of conditions which exist, is it saying too much if we state that at some time, at some point, conditions which might influence the choice are evenly balanced? If such were the case, inherent volition would be essential to a movement of that point at that time.

The ass that starved midway between two straw stacks because he could not make up his mind which way to turn, is used as an illustration by the Materialists to show what might happen if there were no *cause* to definitely decide. I think it should illustrate what would happen if the causes were equal (as the stacks represent) and there was *no* volition.

Volition is no part of the objective mind. The will is a function of the form (brain) which chooses or moves

to the act, but this choice, if it may be so called, is according to the compulsions or necessities (conflicting desires), and it is only when these causes balance that volition could decide.

There is no question at all of this will, or brain function, but the "free will" or "volition" is subject to question. It may neither be affirmed nor denied.

There are only two reasons which cause me to conceive of the existence of volition.

First, I believe it does exist. I feel that under certain conditions I have the ability to choose either of two ways. This feeling is no proof. I feel sometimes as though I could spontaneously fly, but I have not done so yet. The general feeling among human beings that they have the power of choice adds to the weight of the conception, but is not sufficient for proof.

I am conscious of the feeling of will, but I am not conscious of volition. I am not conscious of memory, but only of that which I recollect. I am not conscious of volition, but am conscious of the power to will; but the power to will is causable.

I do not conceive volition is free to choose in *spite* of causes. The definition limits volition by conditions, these conditions are the conditions which limit or prompt will, and we might say the will, therefore, is the condition which limits volition. Volition prompts the will only in the absence (balancing) of other causes and is, therefore, a first cause or attribute of the first cause, *i. e.*, uncaused.

Let us take a concrete example to show what is comprised in the expression "power to choose." We will assume that a very young child is influenced in but two ways, by heredity and by environment; acting solely under these influences, we say the child is not respon-

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sible, but in time the child reaches an age of responsibility. We will take, at this stage, one specific act or opportunity to act. Say it is the first opportunity to take a glass of wine. Supposing the child to be of intemperate parentage, with indifferent raising, this opportunity gives no freedom of choice regarding the act.

Suppose the child to be of temperate ancestry and of Puritan training and no offsetting environment, then there is no temptation and, therefore, no choice is given.

But suppose the child is of degenerate parents but of temperate training; or of excellent ancestry but bad environment, that is, where the physical influence and abhorrence, or the mental temptation and inhibition are balanced, we could by terms of physiology, psychology, or metaphysics show how he might be influenced one way or another. But suppose finally we should show an exact division of causes, these being neutral, there might be freedom of choice without cause to influence. If the act is influenced by a specific cause, that specific cause is responsible for the act. If the causes are equal, they neutralize each other; that is, the causes are equal to nothing as an influence on the choice. It seems an absurdity to say that any certain act could be without specific cause, but volition is an absurdity from a rationalistic standpoint.

There might be brought into the equation the "help of God" and the "prompting of the Devil," but admitting these influences to exist, they but add to the general sum, and if either one is a sufficient cause of an act, that one is the source of responsibility. Although the effect of the act may fall on the specific being committing the act, yet, if there was a cause that influenced

or overpowered the power to choose, it in reality modified or conditioned that power, and there was, therefore, no volition in that act.

It surely does seem to be an absurdity to say there can be no definable cause for an act of volition, yet, to make the Ego or individual responsible, there must be freedom from an influencing cause, which would be responsible.

To be in any degree responsible there must be power to choose or volition. It may be asked who gives this power to choose? Such a question is really just as absurd as to ask, "Who made God, or What made God do so?"

There is no *cause* for volition, memory, or consciousness. If these attributes were *effects*, then there would be a *cause*, but for the power of choice there is no cause. Even granting volition, that any specific act is an act of volition is incapable of proof.

As a human being we measure our consciousness by our ability to comprehend; we measure our memory by our ability to recollect; and volition must be measured by our opportunity, or in other words, it is limited by conditions. An untutored savage is a human being whose Ego possesses the same consciousness, memory, and volition as mine, but as a human being his comprehension, his recollections, and his opportunity to choose are not equal to mine, nor could they possibly be on account of his condition.

Stating that the Ego has volition, does not necessarily mean that each human being has power to choose at any time. The volition of the Ego is, in the body, limited by conditions, as stated in the definition. We admit that in some bodies, imbecile, insane, etc., there is no volition (*i. e.*, responsibility). How much the conditions limit the power of choice in any body I do not know.

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It would seem that as comprehension and experience are increased, as the machinery becomes more intricate, as we grow in mentality, that is, that more intelligence is manifested in the higher forms, that there will be greater opportunities, and the conditions will be less limiting to power of choice. Certainly it seems orthodox to say that the greater our intelligence, the greater our responsibility.

In this connection there naturally arises the question of justice. We admit the fact that all are not equally responsible, and that, therefore, the laws as laid down by us for our government are not, as executed, absolutely just to the beings who are the governed.

Many defer the idea of justice to a future when an Omniscient Judge, who knows all the opportunities and conditions, can reward or punish according to the merits of the case. But if a decisive act results from a *cause* which cannot be forestalled, the *cause* is responsible, and if there is no definite cause for an act, then it was an act without reason, and one who acts without reason is not held responsible.

I do not believe there is any responsibility for human acts, except those resulting to the human body or to the Ego on account of its relation to the body. If I assume that there is no justice here, and no equalization of the injustice hereafter, I am denying the existence of justice.

I do deny the existence of justice at any definite time, now or in the future, *if* by justice we mean equal opportunity or equal improvement of the opportunities, or an equalization of the results caused from an improvement or non-improvement of the opportunities, that is, an equalization by rewards or punishments coming from an external source.

If we offer a boy a green persimmon and a lucious peach to eat, and he chooses the peach, should we reward him further? If from ignorance he chooses the persimmon, should we punish him further for his choice; or if from an idea of mortifying the flesh, he ate the persimmon, should he have a reward to offset the pleasure of the boy who ate the peach?

Our ideas of injustice come from a futile effort to equalize those things which are intrinsically unequal.

In every form of nature inequalities exist. The Desire manifest in one form conflicts which those manifest in another form. This brings me to my second reason for conceiving volition. My first reason was because I think volition is a fact. I feel that I am a responsible being. How I am responsible I do not know any more than I know how I am conscious, or how my food nourishes me. But I no more cease trying to choose what I think is right, because I do not know whether I am acting from heredity, environment, or volition, than I cease eating because I do not understand why one organ secretes and another absorbs. While pure reason will not decide one way or another for volition, yet the absolute impossibility of demonstrating its existence and the necessity of making it an attribute of the First Cause, therefore uncaused, would be sufficient reason for my eliminating it from my conception if there was no additional reason to the one given.

The second reason is absolutely heterodox, yet, to me, it is of great weight in forming a consistent conception of Being. The second reason is because volition could occasion unforeseen variety in manifestations.

If you had a garden for pleasure,¹ would you wish that

¹ Rev. iv., 11.

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garden to put forth every sprout and leaf and flower according to a mathematical plan, to be each day as you expected it to be; or would a variety of growth, of progress, and of development give more pleasure?

If you had a child, would you desire that child to be exactly as you suggested? to have him be perfectly mechanical and automatic, whose every move and action you could predict and foretell; or would you take more pleasure in a child with a will and a way of its own, whose development you could watch as something new; whose character you could believe to be original? I think from an intellectual standpoint there is but one answer.

Now I conceive Being as developing in a variety of ways, because of a variety of Desires, but if there was no volition, there would be an absolute manifestation of the Power according to the Desire, no matter how great the variety, in a mechanical and automatic way which could be foretold and foreseen. But if these atoms have volition, there would be unknown variety of action to the *limits of the conditions* which bound them. As it cannot be demonstrated that the Ego has volition, there is much less chance to demonstrate that any other atom has volition.

On this question of volition hangs one of the greatest problems of Being. If we have volition, to what extent is it limited by conditions, and to what extent can we control our conditions? We are conscious of our Desires, some of which we say are inspirations and aspirations; how much of them are ideal? To what extent are they practical?

In the ordinary inorganic material manifestations, conditions appear absolute, but that may be, and I think is, in appearance only. In organic plant life

conditions are so binding as to give but few illustrations of even apparent volition. In animal life there is apparent power to choose, but it is only when we reach the mental manifestations of man that conditions become so abstract as to allow a current acceptance of the idea of free will.

If we are merely animals with a moral nature, which must be tested; if this earth is simply a hot-bed for the propagation of souls, whose home is not in the Here, but in the Hereafter, then, there is no problem of Being. But I believe man has volition, and could, if conditions permitted, follow the highest Desire of which he is conscious, and following these inspirations would develop a comprehension and give experience for a future work in this world that now seems impossible, because we are so limited by conditions.

I have just said that Being is the manifestation of Power according to a Desire. This Being shows evidence of an intelligent plan. Now if each atom of this Being has volition, could not the plan be rendered futile? This is another form of the old question of the will of God *versus* the free will of man.

Is it possible the Desire shall not be fulfilled? Let me illustrate how such a question may be answered. We may say the inherent desire of a seed is to germinate, grow, and bring forth fruit. I have here a single seed; is it possible that the desire of this seed be not fulfilled? Certainly. I have the power to kill the seed. Is it possible for any one of the many seeds to be killed? Yes it is possible for any of them to be killed or to die to-day; then, if it is possible for any one of them to die to-day, it seems logical to admit that it is possible for all of them to die to-day.

Is it possible for any one animal, man included, to

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be killed or to die to-day? Certainly it is possible. Then we might admit that if it is possible for any one to die, it is possible for all to die to-day. Yet, of what weight is this admission? We immediately say it is not at all *probable*, and in fact so *utterly improbable* that, had we not already admitted it to be possible, we should as quickly say that it is impossible for every seed and every animal in the world to die to-day. As the possible merges into the improbable, so the improbable must merge into the impossible. Where the line is we do not know, and therefore, it is useless to try to agree just how far volition can give variety without neutralizing the Supreme Desire. We recognize certain limits to change, and we define these limits according to a "law of probabilities." But that does not mean that we know why such limits exist or where such limits are.

We know that a certain frame building is liable to burn. We know that any one of a million such buildings are liable to burn, but according to this law of probability, we say that if the million are unexposed they will not all burn the same year. Suppose one hundred insurance companies were organized to carry these risks, and the probability of loss was figured at one per cent.; there are plenty of level-headed, practical business men who would be glad to carry the risk for two per cent., or on a margin of one per cent., which would give a one hundred per cent. profit, less expense, providing this probability held good. If the loss resulted according to the probabilities, ten thousand houses would burn during the year, and these losses would be very evenly divided between the one hundred companies, the class of the risk being equal. If each company has ten thousand risks, and ten thousand losses occur during the year, is there any reason why

the losses should not all be in one company, and none in the others? There is no *reason* at all, but the statement of this possibility would not cause a panic among the stockholders of any one company. So solidly-founded is the belief in the *impossibility* of such an occurrence, or anything approaching it, that the business is established on that basis, and even a fluctuation to two per cent. of losses would bankrupt the strongest company in existence. Statistics show that the fluctuation in a large number of like risks is within a small fraction of one per cent. of the amount of the insurance in force. The fluctuations in reality in existing companies (though rarely exceeding one per cent.) are caused by many risks to one exposure (conflagration risks), or some excessively heavy risk in proportion to the number of risks.

One further point: while the fluctuation is less in proportion to the increased number of risks and the extension of time, yet in any one company we see that the losses are in groups. Make a chart of the losses for a number of years, and it would look like the waves of the ocean, and fully as regular. (The noticeable deviations from the regular being due to unequalled risks.) But why not a dead level of loss? What influence causes any deviations? Aside from certain astrological theories of planetary influence (where post-mortem illustrations seem far more accurate than ante-mortem predictions), I have seen no theory to account for these occurrences. I like to formulate theories, but I like to be plausible, and there seems no plausible reason why there should be one per cent. of fire losses in a certain class of risks, or why losses of a certain class of risks should be unevenly but periodically distributed in time.

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Now all this may seem to be a long way from the subject of volition but it illustrates my point. I said there could be no cause or reason for an act of volition. If an act resulted from a cause it would be predictable, for given the causes, other things being equal, we will know the result. A man of good character does not do a certain evil deed, but instead does a good deed. These are not acts of volition in all probability, but acts of reason, of habit, which are really acts of cause. If acts of volitions are not acts of reason, then they are acts of chance, and as any other acts of chance, could, if we only were able to segregate these acts, be given a law of probability.

Reasonable human beings cannot agree as to our ability as human beings to perform acts of volition. A human being is unable to demonstrate that he is able to do one of two things absolutely uninfluenced by any cause or reason other than his own power of choice. Therefore, I am unable to demonstrate that volition exists or to segregate the acts of volition if it does exist.

We cross two varieties of a plant, we say the resulting plants are a chance, because we do not know the exact degree of hereditary influence. Suppose the governing atom in each germ has volition, that is, when unlimited by other conditions, having power of choice as to whether it would be like its male or female ancestor or a combination of both. Such a possibility exists, as much as there is a possibility for us to be able to perform an act of volition, and if such acts do occur, they are indeed acts of chance, in fact, as well as in appearance. If in chemical affinity the attractions of an atom are equal in opposite directions, there must be volition to decide. The Materialists say such a condition of affairs would upset all calculations on which

science is based, but I do not admit this. The opportunities for choice may be few with most atoms, and the law of probabilities applicable to such opportunities might fix the normal at the minutest fraction of one per cent.

The problem, what proportionate number of the acts of the atom or Ego are subject to variation, is insoluble, for no data exists upon which to form an opinion. But we do know that organization of the atoms with their conflicting desires gives variety in manifestation; that complexity is almost a synonym for variation. In that most complex of beings, man, we know the actions of the more complex intelligent man are of greater variety and therefore less predictable than the actions of an illiterate savage.

When I say that every atom possesses volition, I no more mean that it is possible for an atom or a person under any conditions to choose either of two ways than I mean that it is possible for every living thing to die to-day, and every structure to be consumed, just because I say it is possible for any one living being to die, or any certain structure to be consumed.

We have great faith in our tables of fire rates and mortality tables, and we believe in the stability of material forms, in a certain trueness to type in plants and animals, in a solidity in the social and economic affairs of man. Yet there is a certain unstability or variety, and I believe a certain amount of this is due to volition, or chance, if you prefer to call it chance.

Two entities may be so related that either one would constantly govern, or they might be related so either one would govern according to the strength of the desire. There also might be a time when strength of desire would be equal but in opposite directions. In such a

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case they might act upon the suggestion that instead of separating they draw lots to decide. The Materialists might demonstrate that every movement of this action of drawing lots could be accurately measured and the result shown to be equal to an exact cause. The Dualist might affirm that an Omniscient Being decided to whom the lot should fall, or at least by Omniscience knew to whom it would chance to fall. It is not denying either one of these statements to say that so far as the decision is concerned from the standpoint of the principals, it is a *chance*. But I go to a greater extreme than this illustration. I conceive volition as arbiter of the choice; to be uncaused, therefore, there would exist no Omniscience that could know which would be the choice.

I will try to state this so as to show that it is the only logical conclusion. I have said that Power and Desire are One and the same, but with *two* such different phases as to be inexpressible with the use of *one* word. I have also said that the Power is *conscious* of the Desire and the Desire is *conscious* of the Power. Of the other two attributes (memory and volition), each phase seems to possess or to be able to utilize only one. The Desire possesses memory. A specific amount of Power might be utilized at various times in various ways according to the Desire. The Power is directed by Desire and, therefore, memory is essential to Desire and useless to Power. On the other hand, if the Desire is influenced by causes equally strong, it were powerless to decide of itself, but the Power of choice does decide. Power is conscious of the conflict and decides, but it is a *pure chance decision*, for not possessing memory, it cannot act as judge on the merits of the case; and it is not necessary, for the Desire from its attribute of

memory is as omniscient as is possible, and when there is a *strongest* Desire or influence, that strongest Desire is omnipotent. It is only when the causes are *equal* that it is possible for the Power of choice to decide. The choice of Power is what I term an act of volition.

To me this conception is simple, logical, and consistent. Power is manifesting or materializing according to its various Desires. As each individual Desire possesses memory it dictates the acts with intelligence, but on account of the variations of the Desire there is necessary conflict, which, when the conflict is equal, is decided by the volition of the Power, and as this decision is pure chance, the varieties of form are to a certain extent unknown. But the only difference in condition resulting from this would be a delay of the maturing or fulfilment of one class of Desires instead of another. This conception may apply to a specific movement of the atom, the action of the animal, the conduct of man, the formation of a System, or the involution and evolution of the Universe.

That such a combination of ideas, as a practical fact, is incomprehensible is no argument against the conception. The relation of the phases of Being according to any conception is incomprehensible. To the ordinary non-thinking man *his* conception seems comprehensible, in *fact* as well as in idea, because it is taken *as a matter of fact* without analysis. But *another* conception appears to him incomprehensible because it must be analysed to be at all understandable.

A volition which is pure chance (which is the only logical kind) does not necessitate chaos, nor does it imply that there is no intelligence or knowledge which in comparison to ours might seem omniscient.

Let me illustrate this conception of volition in a

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different manner. If there were a God with omnipotence and omniscience in the superlative degree, who could act but in *one* way, these acts would be like the Materialistic Law, which is equivalent to Fatalism.

If there were *two* ways in which He might act at any given time, there *must* be Power to choose. To say that the way to be chosen would already be known is to foreordain the omnipotent and to say that it could *not* be foreknown is to limit the omniscience. It seems to me plain that as applied to the One Being, omniscience and volition could not co-exist. Also, that in exact proportion to the opportunities for acts of volition must there be a decrease in omniscience. In other words, the greater the number of chance variations, the less accurate may be the prediction. Between the two conflicting attributes I unhesitatingly choose volition.

When we glance over our fire risks or mortality risks, we cannot tell which risk will be a loss this year, or which risk will remain unharmed. We know within a slight variation that a certain number will be lost and a certain number will not be lost. This to one who knew nothing of statistics might seem equivalent to omniscience. Suppose the so-called Omniscent Being viewed our actions as so many risks or chances, experience would give Him knowledge of the probabilities of the fulfilment of Desire inherent in each one.

We, as *human beings*, are first animal, and then what we call mental or spiritual. The animal desires are as essential as the spiritual desires, in fact, they are recognized first; but when a spiritual aspiration or higher desire of the Ego is in conflict with an animal desire or a desire for complete existence as a material being, which will win? What are the probabilities of the chance for the higher desire? I will grant that the

so-called Omniscient Being might know the probabilities to a fraction, under the conditions existing; but if man has volition, He does not know what the individual choice will be, when there is opportunity for a choice. I have deviated here in viewing Being from the standpoint of Omniscience, but I wished to show that volition or chance, according to my definition of the word, does not *necessarily* conflict with science or theology.

Determinism and free will are the extreme conceptions. Determinists look at the risks as a whole and say there is little variation. Free will looks at the individual and seeing such great liability to change, concludes there must be much freedom. One says there is no possibility of any great loss, and the other says there is a possibility of all being lost. One says there is no chance, everything being the effect of a cause according to an absolute law and there can be no individual responsibility. The other says there is individual responsibility, because there is individual power of choice, which takes the act out of the law of cause and effect as well as the law of chance and probability.

It seems that any interpretation of volition must effect the general interpretation of responsibility.

The theological conception of responsibility seems to be that we are not only answerable for our choice, but must answer to an external Power, that is, that either here or in the hereafter, a person shall be additionally punished for a wrong choice and rewarded for a right choice.

We will suppose that there is a Judge who is able to fix accurately the responsibility for each choice, and at a certain day render judgment, distributing the penalties and rewards so there shall be absolute justice.

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Then to preserve the equity from that moment, our characteristics must change. We must cease to possess memory, or at least the power of recollection, for one person might recollect only the things which would cause misery and another only the things which would cause happiness. We must cease to possess what is termed free will, for a single act of volition might render unequal the things which had been made equal.

Determinists claim for their conception absolute justice, because where everything is according to an absolute law of cause and effect, there could be no injustice.

Theologians acknowledge injustice through man's free will, therefore think it necessary that these inequalities be arbitrarily adjusted by a competent Judge.

I see no necessity of going to either extreme. Some abhor the idea of a God who could say: "I will visit the sins of the fathers upon the children even unto the third and fourth generation." But that is not simply a traditional conception of a God, it is a fact of Being. We all know it to be a *material fact*, and so far as it is a fact, the child shares the responsibility with the father, and just to the extent to which the child is answerable is he held responsible. So it is on all sides. We are to a certain extent responsible for the acts of others and are not held responsible for all of our own acts.

"But," says one, "we mean the moral responsibility; the one who ought to be answerable will finally be made to answer." If this were possible, then the one who has already shared this responsibility must be in some way rewarded. But in what way can he be? As I said before, we think the loss to the individual risk is great

and unequal, therefore unjust. Our sense of injustice is from our comprehension, which is on the material plane conscious only to the Ego. The atoms of the body are probably not conscious of any injustice. When I spoke of sharing responsibility, I did not mean to limit it to the Ego. The results of each act are shared by the atoms of not only our body, but possibly those of many other bodies. The responsibility of the Ego, aside from its result to the body, must be limited to memory and what results may come from that in the future we do not know. I believe there will be results, but have no idea of how or where, as I have nothing on which to base a conception.¹

Whenever the choice is one of volition, it cannot be a deliberate choice knowingly between good and evil. But the choice being made, will, according as it is good or evil, result in causes which in turn will influence a later act, which act, therefore, will not be one of volition. My efforts may or may not effect my chances of being right in the acts of volition, but my efforts to do right and continue right must improve my opportunities to choose between two rights and to a degree eliminate the necessity of choosing between two wrongs.

It seems plain that a knowing choice between right and wrong could not be a choice of volition, for a person must be good or bad, in order to make such a choice, and previous acts were responsible for such a condition. This condition would apply only to a specific act or class of acts. One may be right in one thing and wrong in another. If I merit no praise because chance made me choose the good, then he who chooses the bad

(¹ Theosophy and other Idealistic conceptions, as well as some of the Dualistic, explain the celestial future to the satisfaction of whoever is thereby satisfied.

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deserves no condemnation, but each to a degree is conditioned by his choice.

I must illustrate further what is meant by saying volition is limited by conditions. Mr. A boards the train at New York City, with a through ticket to Chicago. I say to Mr. A: "You can, if you wish, get off at Albany, and let the train go on without you, or you can keep your seat and go on with the train." Mr. A. may admit that he has the power to choose, and therefore the choice is one of volition. Let us go still farther and say: "Mr. A, you may get off at yonder crossroad and let the train go on, or remain in your seat and go on with the train." Mr. A may admit that he has the power of choice in this case; if so, this would apply to every crossroad between New York and Chicago, and it could be applied to every person travelling from one city to another. And yet how absurd it would sound to say that it is possible that every person who starts next year from New York to Chicago will get off at a certain crossroad at the suggestion to "stop here and buy a lot!" It is so utterly improbable that we quickly say it is *impossible*. So I say that the volition or the opportunity for it to choose is so limited by conditions as to make for its exercise an unknown quantity. I have not the faintest idea whether the opportunity to exercise volition or power of choice comes once a day, once a year, or once in a lifetime.

What an absurd conception, says the Materialist, that any act may be without cause, that the laws of nature are in the faintest degree subject to chance! Yet this conception is not so extreme as that of the Materialist who says there can be *no* act of volition.

What an absurd conception, says the theologian,

that man has not perfect free will to choose between right and wrong, anywhere, at any time! Yet this conception is not so extreme as the idea that every act is one of volition and that man has *absolute power* to do or not to do in each movement, and in addition maintain the idea that there is a Greater Power who knows, before the choice is made, just what the choice will be.

Let us see how we would operate under the different conceptions. Materialists say, we recognize that it is perfectly natural for man to take what he wants, if he has the chance, the same as any animal. We also recognize the fact that it is better for humanity that man take that only which rightly belongs to him. We can teach a cat or a dog by punishment to leave things alone, so we can teach man. We specify certain acts which are wrong and fix the penalties. We say: "Thou shalt not steal," and through fear of going to jail, he refrains from stealing. There is no question of volition. The fear of the law is part of the environment which influences him or causes him to be honest. Some may want more than they fear, and yielding to the temptations, they become dishonest. Some are caught and punished, and thereby some are reformed by the increased fear they have of the law and are additional warnings to others.

Theologians say: We believe man is different from the animal. Man has a moral sense. You could never teach a cat or dog to refrain from stealing solely by a promise of future reward. We recognize that it is natural for man to steal, but we believe this is not right, for God says in His commandments "Thou shalt not steal." Now if you will obey God's commandments, He will take you home to heaven with Him

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when you die. This hope of heaven causes many to be honest.

There are some, we may say, who rely on a belief of forgiveness of sin, and break a commandment when convenient, and by a simple penance or repentance are again firm in their hope of heaven. Again, there are some who say: "I have sized up this idea of heaven and hell, and do not believe the difference is worth the cost." Such a person certainly is not a hypocrite, and as a man honest in his opinion, the theologians have no way of reaching him.

These are very bald statements, but accurately portray the conception of many of each class.

I will admit with the others that it is as natural for man to steal or to take what he wishes as it is for any other animal to do so. (Of course, we all recognize the fact that the inherent tendency is more or less strong in different persons and in cat and dog as well as man.) I recognize with either side that fear and hope are great bars to dishonest acts, but in spite of these barriers we hear an honest man referred to in terms of great respect. We hear the statement: "He is a thoroughly reliable man," spoken in such an expressive way as to give the impression that a *man* is now as rare as in the time of Diogenes. But honesty is not an absolute virtue; it is only comparative. Suppose all men were honest, the very word honest would become obsolete. So far as fear or hope influence a man to be honest, they are the *causes* of his action, and therefore, are conditions which limit volition.

Now, if we endeavor to make conditions so there is no incentive to dishonesty; to arrange affairs so that it pays man better to be honest than dishonest, are we not improving the conditions of society? In neither

case have I mentioned what may be called the innate morality of man. To the innately honest man the fear of punishment, the hope of reward, or the lack of opportunity are alike inapplicable, and whether through volition he started toward becoming innately honest, certainly he could not then by volition become dishonest. I have used honesty here as a term by which to illustrate any or all of the other terms representing goodness that might be used. As we believe that innate goodness is not yet a universal trait, we must each try according to our conception to influence men to the right, either by fear, by hope, or by improved environment.

CHAPTER IX

DESIRE

THE idea expressed by the word "Desire" would ordinarily seem simple in its analysis. But this, like all metaphysical ideas, might be and is in the analysis interpreted in various ways. In fact, many say that desire is not a metaphysical idea at all but purely physical. They really mean that desire is purely objective in its origin. But anything of purely objective or material origin must be mechanical, admitting of mathematical demonstration, and in the ultimate comprehensible. "I want a dollar," seems to be a simple desire definitely expressed, but on analysis we see that it is not a dollar I want but what the dollar will obtain. Also on further analysis we see that it is not the bread or book obtained with the dollar that I want but the gratification of a desire, which gratification I expect from the bread or book. And when we go to analyze this desire we find ourselves on the debatable ground between physics and metaphysics.

It is impossible for any one to demonstrate the primary origin of Desire. It is impossible to demonstrate that Desire exists except as a fact of consciousness.

Desire, either the individual, the collective, or the supreme is incomprehensible and incapable of mathematical or mechanical demonstration. Our individual

desire is a fact of consciousness, that is as much as we can declare.

Various organisms appear to have desire. Nature appears to act as though some intelligent Desire were being gratified.

I have emphasized the point that we as human beings are conscious only on the material plane. We could in no way understand what were the meaning of the demands of desire except they could be interpreted in sensible terms. We know in a way how we feel when we are hungry, but we have no way of knowing how the other atoms of the organization feel. They *must* feel, for it is only *through* their feelings that the Ego is conscious of hunger. We see some luscious fruit that makes our mouths water and we say it awakens an appetite; we see a loathsome object and we say it has an opposite effect. So far as there could be any *material* transmission of sensation, it must be equivalent in each case. The different effect, then, is solely one of interpretation of the impressions. Then absolutely the same *amount* of sensation may be interpreted in various ways. Various perceptions may result from equivalent impressions.

One who did not know anything of optics could hardly be convinced solely by reason that the rays coming from a prism were equivalent to those entering the prism. In saying that we as individuals, and the various atoms, and the various different organisms which are composed of the atoms, have the same desire, we do not mean that it is identical but that the desire is equivalent.

A baby, although conscious that it is hungry, does not at all comprehend what hunger is. We may desire a breath of fresh air but we are not conscious of a specific

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desire for the mechanical movement necessary to breathing, yet that movement being spontaneous in its initiation *must* be desirable to some or all of the atoms party to that movement. This idea of the conscious Desire of the atoms is the only one consistent with the facts of Being. The cells of the acting muscular tissue are not *directly* kept alive by the movement of breathing, and the idea that unconscious inert material could spontaneously execute an intricate mechanical movement is certainly an inconsistent idea.

The manifestation of Desire in a material form, the perception of these forms through other forms organized for this special purpose (to thus function) is of course incomprehensible, but if we rid ourselves of the idea that consciousness necessitates comprehension, and realize that we can have no idea of the conscious interpretation of Desire either primarily or as recognized as necessities of an organism, excepting according to *our own* consciousness, then the *conception* of universal atomic consciousness becomes simple and easily understandable as being perfectly consistent with the facts of Being.

Those who say desire is of physical origin assert that it is impossible for any desire to exist except as it arises through experience. The materialistic idea that evolution is caused *wholly* by environment (hereditary traits being primarily effected by environment are a secondary occasion of evolution) necessitates the organ before the function. Many scientists rebel against this conception and assert that the function must be first. Now what is function? It is simply a desire which incites atoms to organize in a form to gratify the desire, which form we call the organ.

I have spoken of the higher form as one which is

more complex. The higher desire is coexistent with the higher form but it requires a separate definition. One desire is higher than another desire when its gratification gives a greater degree of satisfaction. This definition might be misinterpreted and some one would say that to many the gratification of appetite gives a greater degree of satisfaction than the gratification of the mental desires. In order to avoid such a criticism I will define the higher desire as one whose *continued* gratification, as conditions permit, will give the greater degree of satisfaction. This we readily recognize as a fact of experience. The lower or gross desires are more quickly satisfied and then a continued gratification causes disgust instead of satisfaction. By observation we are led to believe that the gratification of the mental desires of the intellectual man causes a greater degree of satisfaction than does the gratification of the physical desires of the savage. Experience teaches us that continued gratification of the so-called good desires gives a greater degree of satisfaction than the continued gratification of the so-called bad desires. In fact there is no *measure* of good and bad except as the result of this experience, and in spite of the belief in aspiration and inspiration, if experience did not prove there was greater satisfaction from following them, there would be no evolution. No organism would continuously do a thing unless there was a degree of satisfaction in such action. We know that *each* man does not do as experience directs, for which we will soon be able to formulate a reason.

It is admitted that an intellectual man is a more complex form than a savage, that consequently his desires will be more varied (the gratification of these desires making a more complex environment) and that

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by the gratification of these higher desires there is a greater degree of satisfaction. We will no doubt admit that even in the lowest savage there is a certain mental desire, the gratification of which gives to the life of the savage a greater degree of satisfaction than that of a lower order of animal. Observation would certainly cause us to assume that an animal gets a greater degree of satisfaction out of life than a plant does. From this we can consistently assume that the organism gets a greater degree of satisfaction out of life than the inorganic does out of mere existence. By this assumption we have a simple reason *why* the atoms organize and *why* there is evolution.

When I assume that, as conditions permit, atoms organize spontaneously because they have a desire (function) which organizing (evolving organs) will enable them to gratify; when the Materialist assumes that the atoms organize because they are compelled to by the laws of nature; when the Dualist assumes that the atoms organize as an essential action in the fulfilment of the will of an exterior God; there is in these various conceptions no contradiction in fact, nor any effort by either to explain *how* the organization is accomplished. The only difference is in the conception. In the Materialistic conception there is really no answer to the *why*. Saying "Because compelled by the laws of nature" does not give an intelligent reason. In the Dualistic conception there *is* an intelligent answer to the *why*. There is a *satisfaction* of an *intelligence*. But on account of the physical difficulties of the actual operation under this conception and with no apparent *material* necessity for a Dualism, there has arisen, as a natural consequence, a repudiation of the Dualism by those termed Materialists. Many recognize that the

Materialists have repudiated too much and in an effort to avoid the extremes we have the Monistic conception, which, to my mind, comes the nearest to expressing the true relations of Being of any of the four historical conceptions. Monism seems to me Materialism grafted with spiritistic ideas. But the Monists wish the material to spontaneously create an intelligent God (consciousness), which is as spiritually difficult to do as it is (to satisfy our intellect) physically difficult for an intelligent, exterior, spiritual God to create mechanically a material universe.

I think the Comprehensive Conception obviates certain intellectual difficulties inherent in each of the other conceptions. The *how* is incomprehensible under *any* conception. The *why* is more logically plausible under the Comprehensive Conception.

The higher form, the organ for the manifestation of the higher desire, is simply a greater capacity for enjoyment. One pertinent point I wish to make here is that the capacity is increased more by doing than by being done for. "Only those are able to bear meat who by *use of their reason* know good from evil"; not those who utilize alone the reason of others, or try to know good from evil by printed directions. Those who *do* physically; those who *think* mentally; those who *act* spiritually are the ones who develop an increased capacity. Following the higher Desire is evolving a higher form and giving to the gratification of Desire a greater degree of satisfaction.

Materialists have started at the bottom and by working up have proved evolution. I will accept evolution as a fact and by starting at the top will give a few illustrations to show why evolution is necessary.

Man says stealing is wrong and the majority refrain

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from stealing. Why? Solely because it is wrong? No, but because in the organization of society experience has taught that a greater degree of satisfaction exists when property is sacred. This idea must have been an inspiration primarily but which has been ratified or made right by experience.

We empty slop into a trough and the hogs will crowd and squeal, fight for the morsels and defile them with their feet. Place food before man and he will not ordinarily act like a hog; not because it is wrong to do so, but because there is a greater degree of satisfaction from the possession of table manners. This is not solely an evolution of the individual but an evolution of society of which the individual is a part. Table manners are probably one of the first steps in the evolution of society, yet so slow is evolution, or the effect of experience, that I have seen a family of Indians where the members helped themselves from the contents of a single pot and in their eagerness upset the pot and tumbled the contents into the dirt. Whenever a number of civilized people are placed in a position bordering on starvation, they will generally revert to animalism. All Desire is persistent but the ability of any Desire to a persistent control of the organism seems to be proportionate to the duration of the experience of such an organism (*i. e.*, the oldest forms are the most stable).

Suppose a man has an idea that the organization of a fire insurance association would be a good thing and he suggests to a number of men the advisability of organizing. Assuming this to be a new idea, we can readily see there would be reluctance to enter such an organization, and, provided the organization was perfected, if conditions caused it to fail of its object, there

would be still greater difficulty to the perfection of a second organization within the sphere of the experience of the first. But no matter how many failures, the desire being persistent, there would sooner or later be a time when some organization would succeed. This continued, would give experience aiding successive organizations. These organizations might increase until their very multiplicity would occasion the failure of some of them. This illustration shows the necessity of the desire before the action; the function before the organ. It also shows that the *growth* of the materialized desire and its stability hinges on the experience, *i. e.*, the result of conditions, otherwise termed "the survival of the fittest."

The efforts of plants to protect exposed or irritated parts; the formation of a pearl (result of protection from exterior source of irritation); the organization of a fire assurance association, may each be a manifestation showing the varied interpretation of an *equivalent* Desire.

We can see that according to this assumption it would be impossible for an intrinsically bad desire to have a continuous existence. I, therefore, conclude there are *primarily* no bad desires. A desire may be incorrectly interpreted; may be badly executed; or improperly located; or wrongly conditioned; or in various ways appear evil, but primarily that desire was essential to evolution, and its gratification gave a certain degree of satisfaction.

Reverting to our efforts to organize the first assurance association, the causes for and against such an organization might be equal: the desire to obtain the supposed benefits, the fear of a failure, the desire for something new, the reluctance to depart from precedent. The

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pros and cons balancing, I assume that volition decides. From observation and experience we say that in the long run *chances* are even, therefore, sooner or later even if left to volition, there must come a time when there would be an organization, and then its development would depend on conditions.

I wish to make another point here to show why I am optimistic regarding the necessity of continued evolution of human organizations. I speak of those desires as animal whose fulfilment is essential to a development of the animal. There is practically but little increase of these desires in number or variety. The mental and spiritual desires are rapidly increasing in number and variety. That is becoming manifest. If it is true that a higher desire is one whose gratification gives a greater degree of satisfaction and that the mental and spiritual desires *are higher* than the animal desires, then the increase in the number and variety of these desires will continually augment the number of cases in which the conflict between animal desires and mental or spiritual desires becomes equal. And if we believe that "chances are in the long run equal," then by volition there would be a continued increase of cases where the mental or spiritual desire would be the choice, and the action following this choice would be a step in the evolution of the conduct of man. Our measure of the importance of the conduct of a man is according to the degree to which such conduct has been instrumental in perfecting an organization, political, economic, educational, or religious, whereby our animal, mental, or spiritual desires could be the more completely gratified.

When it is realized that there are no known limits to man's mental and spiritual evolution *here*, we will proceed to *utilize* the greater portion of that enormous

energy which is now being used (not utilized) in preparing for an imaginary hereafter. Then optimism will be justified.

The stability of the social organisms are proportionate to the experience. The integrity of the family and table manners are examples of the most stable, or fixed, because of the longest duration. Political and economic organizations are much less stable, or fixed, because of shorter duration. The latter are more complex in their organization and when through experience and proper conditions the organization is perfected the satisfaction accruing from such an organization will be proportionately great. This does not mean that an economic organization will give greater satisfaction than a family, but that the satisfaction of individual and family may be proportionate to the perfection of the economic organizations.

I speak of the desire of the atoms causing a co-operative organization or organism. I do not mean that a number of atoms may have a desire to read a book and with premeditated forethought spontaneously form into a man. We say hunger is the desire for food, but it is impossible to describe hunger in the abstract. The desire for food is simply the desire of the atoms to maintain the organism. The atoms would continue to exist without food, but the organism would not; therefore it is to the atoms, just as it is to the Ego, a psychical consciousness of a physical need, *not* of the individual but of the organism.

Our comprehension being so definitely limited to the material plane, we do not in any way know what consciousness on the atomic or spiritual plane may be like. I shall continue to speak definitely of Desire, although it must be distinctly understood that sub-

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jectively we do not comprehend even our own desires. It is only objectively or through the object of the desire that it becomes comprehensible, and is fulfilled. And the object of our desires is never as far from us as a desire to read a book is from an unorganized swarm of atoms. However, the steps from object to object leads some of the atoms, as conditions permit, inevitably from matter to man, and if we were able to follow these steps, they would probably be as plain as the steps from family to State in the human organizations.

I assume that the process of evolution is the same anywhere, due allowance being made for the degree of comprehension. We have no means of knowing how many forms of organisms have failed from not being suitable to the conditions. Not only must the conditions be right, but usually those forms would best succeed which varied least, *i.e.*, were best able to utilize experience. But occasionally there might be organized a form which was exceptionally well conditioned and it might succeed better than previously evolved forms. This *radical* departure from type occasioning *rapid* strides in evolution has been one of the puzzles of biology. This evolution by "sports" is a theory in opposition to Darwinism. I believe *man* to be one of these *radical departures*.

The complex form is less stable than the simple form, not only on account of its life being based on less experience but on account of the greater number of conflicting desires which compose the more complex forms. If the gratification of the cells of my body gives me satisfaction, and the gratification of the various sense organs gives me pleasure, there is just as much reason for assuming that the recognition by the Ego of a spiritual aspiration gives all the atoms of my body

a certain degree of satisfaction. This I conceive is the *reason* for the atoms organizing in a form (brain) capable of recognizing mental and spiritual impressions or desires on the material plane or with an objective. We, as human beings, had nothing to do with the organization of the form. As conditions have permitted, the forms which have best served the purpose of giving to the gratification of desire the greatest degree of satisfaction have been the ones that have evolved and succeeded. Desire has been the instigator and experience has been the arbiter.

The development of the persons of the *genus homo* has been under various conditions and with each person the conditions vary with time. We must realize that while we can formulate ideas from general experience (knowledge), it is much more difficult to regulate specific actions by general experience. Knowledge counts for less in the evolution of the person than habit. Personal experience (habit) counts for less in the evolution of the race than the collective experience (heredity), on account of the various conflicting bodily desires satisfied by personal experience. With no arbiter but personal experience, the strongest desire would invariably control. We may readily perceive that "strongest" and "highest" are not necessarily synonymous terms. Two persons have each a desire for food. We may easily assume that under certain conditions the desire in each for food could be so strong as to obscure the desire for culture. We may also easily bring to mind two persons, one of whom we say would give up much more quickly the higher desire for culture for the stronger desire for food; in other words, would sacrifice much less for culture than the other. The reason for this action we assume to be

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either from the result of organic collective experience (heredity); personal experience (habit), or general experience (knowledge); in either case modified by will, which in turn is more or less strong as a result of any or all of the above causes. To the above reasons for a variation of action according to a specific desire, add an infinite variety of objective impulses from environment and we readily see that to find that which actually occasions a given action is not simple. From microbe to man the more complex the structure the more complex *may* be the cause or occasion for a given motion. Every spontaneous action, whatever may be its occasion, is instigated by desire. This is a simple conception, but as every action is composed of a multitude of motions of various organisms, which from molecule to cell and from tissue to organ may be in accord with the final action, but which frequently have desires strongly opposed to the action, we see that any given action is not easily comprehensible. We know from experience and observation that under certain circumstances a certain person will in all probability act in a certain manner and we say this typifies or manifests his character. We will all admit the various causes previously given as influencing the formation of character, but just as soon as we attempt to fix the *definite* cause of character the conception will influence the definition. Idealists will emphasize desire (psychic); Materialists will emphasize conditions (material); Dualists will emphasize volition (free will); and Monists will emphasize necessity (spiritual). According to the Comprehensive Conception, each of the other conceptions may be right under certain circumstances but each is not right under all circumstances. Desire, volition, exterior conditions, either material or spiritual,

may singly or in combination form a man's character. I do not expect those having a different conception to agree with the above statement any more readily than they agree with their opponents. The following formulation of a reason why each man does not do as experience dictates may be acceptable to those who agree with the previous statements. It is because experience itself is different when viewed from an organic, personal, or general standpoint, and in any event is not to any single person wide enough to cover specific actions under all circumstances.

The motion of the atom, the action of the organism, the conduct of man are each a manifestation of Desire. The impulses for these manifestations are consciously equivalent, but to each the anticipation is not equally comprehensible. Each is primarily spontaneous but automatic according to the amount of experience. Conduct embraces *action* and *motion*. Action embraces motion. The words "motion," "action," and "conduct" express steps in evolution.

The forms of organization, social and civic, constructed by human beings are the most imperfect of organizations because of the lack of experience. The gathering of general experience by history, and the ability to accumulate it through the art of printing has been rapidly perfecting many human organizations. The human being as an animal is the least perfect of any of the animals. The reasons have been given, but to repeat: the human is of comparative recent origin and the organism is the most complex, therefore the action of the organism is the least automatic. But perfection of form is not the goal. The goal is to *organize a form that will allow the gratification of Desire its greatest degree of satisfaction*. We believe that *for this purpose*

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the human form is the nearest perfect and, that with the exception of a continued increased complexity of the organism of the brain and the further elimination of some useless organs, the human forms are, *for its purpose*, perfect. That is, it is the assumption that no higher form of animal will be evolved. The evolution of *atomic organization* is about completed. The evolution of *human organizations* has just begun. The human organizations may be perfected more speedily on account of our progressive ability to accumulate and utilize experience (get knowledge).

The statement, "there is no such thing as dead matter," has become very common lately. It is so familiar as to seem like the orthodox expression of some great organization. What does it mean? If it has any meaning, it *must* mean that "all matter is alive." Being more definite, this latter statement sounds more absurd, if we use any ordinary definition of "alive." Some say that alive means to respond to impressions, but we *all* know that any material may respond to impressions or, if disputed, we could prove it by knocking a ball into the air. We might say that one ball had more life than another ball, meaning a greater elasticity, but that is not what a Monist means when he says matter is not dead. If instead of saying "matter is alive," we say, "the atoms are conscious," we substitute a more definite statement for an indefinite statement. The only reason why such a statement is not made is because the term "consciousness" has carried the conception of comprehension, and the idea immediately occurs that if the atoms were conscious, then when a man sits on a tack the tack ought to yell as loud as the man does.

There is one trouble in getting a consideration of a

new conception, it is measured by a preconception, and as it fails to correspond, it is necessarily absurd. Various Idealistic conceptions are received because they are vaguely, not to say vainly, expressed or described. If being definite results in killing this Comprehensive Conception, I am going to be so. There seems no vagueness, nor is anything meant in a mystical sense when I say "there is a Powerful Desire, or a Desirous Power, which is manifest as Nature." Every particle of the Universe is a materialization of that Power, and every form is a manifestation of that Desire. Every atom being conscious and having memory and volition, the forms that are desirable are organized as conditions permit. The conflict of these Desires form the conditions we term heterogeneous. Desire is fulfilled as the form is organized which gratifies that Desire with the greatest degree of satisfaction. Through ages of experience (possible only on account of memory) various forms have been perfected. Many have served their term of usefulness and have become extinct. But it is the *form*, not the Power or the Desire, that is dead and gone. Desire is ever young yet persistent. It continues *when conditions permit* to create a crystal or organize a cell; but also, when conditions permit, it assays a greater fulfilment.

We hear it said that man's organizations are faulty because they are human, while natural forms are perfect because made by God. But "God is in all," or in nothing. If He is "all in all," then He is imperfect, because none but the simplest forms, such as crystals and cells, are perfect. The insistence on a *perfect* God has caused many to say, "then there is no God." Our conception of the perfection or imperfection of God (or Nature) must depend on the definition of perfect.

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I have said that man was the least perfect of the animals and also that he was the nearest perfect. The degree of perfection must depend on the standard of measurement. A perfect square cannot at the same time be a perfect sphere. While the word perfect is superlative, as an idea it is essentially comparative, and to say that the Universe, Nature, or God is perfect is no more reverent or pertinent than to say it is imperfect, for there is no other with which to effect a comparison. I am not afraid to say that I believe God is all in all and of necessity *imperfect* because always changing. This is a contradiction to the expression previously used, "God the same yesterday, to-day, and forever." The contradiction comes from trying to make one word (God) answer for the three phases of Being. When I use the terms Power, Desire, Manifestation, or say that the Supreme Being (Universe) is the Materialization of a Powerful Desire, I use words that have a definite meaning and they form a sensible, therefore, Comprehensive Conception. If it will conciliate any one, I am willing to say that the Power and the Desire are *perfect* and that it is only through the conflict of the individual Desires that the Manifestation is imperfect.

Many writers, in advancing new ideas, unconsciously through fear of being heterodox or consciously through fear of assault, seek to cover their advance behind orthodox symbols. They are like Cambyses, who, when advancing against the Egyptians, placed a row of ibises in front. The Egyptians, it is said, suffered defeat rather than discharge an arrow which might wound the birds they worshipped. This may be good policy, and I would have no hesitancy in adopting it if I were primarily interested in the acceptance of this conception or feared that it is vulnerable. Nor is it

that I am certain that it is invulnerable, but that if it ~~is~~ vulnerable, it deserves to die. But no, it may, like Apollo, be vulnerable in only a minor part, and if so, it might be worth preserving. I do feel that a correct conception of Being is of great importance. When I see the temples erected to the unknown and admittedly unknowable God, I feel like crying with Paul, "Whom, therefore, ye ignorantly worship, Him declare I unto you."

No doubt many will cry Atheist, Pantheist, and various other names meant to express disapprobation. The most effective way to express disapprobation is to ignore. Many a worthless book has been sold on account of the criticisms of the preacher. If this Comprehensive Conception "fills a long felt want," denunciation cannot kill it. If the truth be not in it, it will not live but be like all misconceptions.

CHAPTER X

FORCE

I HAVE stated that in my conception of Being there is a Power and Desire. It may be termed a Power with a Desire to act, or a Desire with Power to act, and that the act is manifest in the materialization which we term Being. The structure of Being is atomic, and in each atom are inherent consciousness, memory, and volition. But this Power alone, even with its attributes, is not sufficient to account for the materialization, or the various forms of Being as we perceive them.

I will give five illustrations to show that there is another essential.

FIRST—Let us take (in imagination) two atoms of a maximum of attraction (I have no reason for thinking there is any difference in the Power of each atom, but I say maximum to cover the point), and if these two atoms should come together in contact, there would be no power to separate them. This statement seems so self-evident that there is no use in an effort to elucidate the point.

SECOND—Let us take a tight vessel containing a mixture of oxygen and hydrogen gas of a specific gravity even less than air, and in some way spark them. The result is a terrific explosion. What part has our Power

had in this? We find of our oxygen and hydrogen a few drops of water. That form of the power of attraction, which we call affinity (and cohesion), has drawn together these atoms into a form which we call water. But what caused the explosion? The only attempts I ever saw at an explanation are similar to the statement that, "The atoms in forming molecules took up more space in performing the necessary evolution than they occupied as a gas, and the sudden occupancy of the space caused the explosion." Does it look plausible that the amount of matter represented in a few drops of water, but occupying space many times greater, and even more space than the normal, would require *still more* space to condense from gas to liquid? But even granting the statement, that does not mechanically explain how an attractive Power could in the very act of attracting, repel itself.

THIRD—Again; let us take an air-tight vessel containing a small amount of carbon (ordinary coal) and sufficient oxygen to unite with it, spark them and what is the result? If the coal was sufficiently fine, there would be an explosion, but ordinarily there would occur what we call combustion. We have in the vessel, as a result, carbon dioxide, a union of carbon and oxygen, but they are occupying less space than they did before the union; that is, the power of attraction, in what we call chemical affinity, has drawn the atoms closer together. This would seem simple enough, but something else has occurred. The walls of the vessel have been heated, they have expanded, the surrounding atmosphere has been repulsed. What has done this? Certainly no variety of the attractive Power could account for it. All the attractive Power is still there. It weighs just as much. The affinity is just the same.

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What affected the walls of the vessel and the surrounding atmosphere? Says one: "Why, heat has been radiated." What is this heat? Nothing has gone which was there before so far as can possibly be detected in any material way. "Why, heat is only a mode of motion, and the motion has been transferred to the vessel," etc. But the ultimate motion was in the contrary direction, it was away from the vessel, for the material occupies less space than it did before the union. "Yes, but in uniting it took a vibratory or oscillating motion and in the outward movement or swing the atom came into contact with the sides of the vessel, and this motion was by contact conveyed by the vessel to the air, and so on." That seems plausible, but when the carbon and oxygen come together, why should they come in such a roundabout way? What peculiar part of affinity is it which causes these atoms to shoot off at a tangent with so great a force that it stretches the walls of the vessel, which are held together by a cohesion apparently much stronger than the affinity, which draws together the atom of this carbon and oxygen?

FOURTH—As another illustration, let us exert force on a material by pressure or friction beyond its ability to resist, and what is the result? This force flows off in what we call electricity or lightning. We see a definite amount of force come from the cloud to the earth, and in its passage, rends asunder the air, and repels the earth as it strikes. I cannot conceive of any phase of the attractive Power being the sole cause of this stroke of lightning (according to any ordinary material conception).

FIFTH—As a final illustration, take gas compressed so it exerts a force of hundreds of pounds to the square

inch, and what is the force which causes the exertion? The mechanical compression, which may be due to gravitation, in no way explains the expansive force, which maintains a constant tension under constant temperature.

From the foregoing illustrations, which are but a sample of the phenomena found in practically every form of energy, it will be seen that attraction, although it may be called the Supreme Power, is not the only Power. My conception of Being requires another and different Power.

In science we see a constant reference to terms expressive of a repulsive power, heat, electricity, ether, elasticity; and none of these phenomena accountable wholly and directly to any form of attraction. There is no definite name or description of this tacitly recognized force which is in opposition to attraction. All religions have their God and Devil; the latter, the Prince of Darkness, more vaguely defined; but dimly recognized.

There are many scientists who acknowledge the power of attraction, but assert that all phenomena may be attributed solely to that power. There are many theologians who say there is but one God, and there are no secondary gods or devils.

But no matter how strongly physicists or theologians may insist on but the one Power, each in some way will admit something that shows a characteristic *contrary* to the Power as defined, and find it necessary to explain in many contradictory ways, how and why these opposite qualities exist.

I assume the existence of an opposition to the Power. To prevent confusion I will call this opposition Force—the Power of attraction and the Force of expansion.

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I conceive that in Power and Force lies the source of all the phenomena of nature; that in the Universe nothing is known to exist nor is it necessary to assume the existence of any other entity than these two: Power and Force.

I will take up various examples of the phenomena of nature, or the various phases of Being, and try to show how in these manifestations Power and Force are related.

I have already defined one as Power with the Desire, or the Desire with Power. It is easy to see that these two words express different aspects of the same part of Being, and that it is wholly spiritual, but that the Power and Desire *is known* to us, only by its Materialization.

I feel as though I must emphasize here by a repetition. We, as human beings, are conscious only on the material plane, and it is absolutely impossible for us so constituted to comprehend "spirit." You may be skeptical of that statement, but please consider it. Nothing is comprehensible but what is sensible, and nothing is sensible but what can be interpreted in terms of one or more of the five senses. We cannot comprehend nothing. We indirectly form an idea of nothing as a negation of a certain something. We can conceive of no "immaterial" without in some way relating it to a material. Spirit, to us as human beings, is *nothing* unless manifest or materialized.

Power is materialized according to its Desire. I do not wish to be misunderstood when I say that no Power exists but as matter, but that expresses my meaning. I will modify this by saying, I do not mean that we have or can now recognize all the existent manifestations of matter in a definite space, but I assume that there is a definite amount in a definite space. To put it in forcible

language, I mean there is no Power (God, Man, or Devil), that can make one pound of gold weigh two pounds under the same conditions.

A scientist would say that matter is uncreatable and indestructible.

A theologian would admit that God could not make another God equally as great as himself, nor could he cut himself in two and annihilate one half, so we really agree.

The simple materialization of Power, as matter, would not give much variety. Practically we would get nothing but density and weight. Density being the amount of Power, or the number of atoms in a given space; and the weight, the ratio of atoms in a given space to the number of atoms in another given space.

What we know of matter solely as a materialization of *Power* is little or nothing. The greater the natural density, the greater the weight, but the less the elasticity. Elasticity, however, brings in *Force* as an essential part of the form, and there is *no* material without some degree of elasticity.

The manifestations of matter or its materialization is the phenomena with which we are familiar. These manifestations are due not only to a Power, but a Force. The Power and Force are two distinct entities, never interchangeable or annihilating. The Power is materialized but the Force is never materialized.¹

¹ The flow or flux of Force from one atom to another is divided into pulses, beats, or waves. The minimum division is probably an aliquot part of any larger division and is called by the advanced scientists the "magnetic atom" or "magneton." Whether or not these magnetons retain their individuality, or coalesce and cease to maintain distinctive parts under new divisions, is of course unknown. The essential difference between the electron and the magneton wherein the former has mass, therefore can be materialized, while the latter does not possess

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We comprehend Power (when materialized) and it is wholly through or by Power in motion that we get our conception of space.

Though Power and Force are exactly opposite, Force is essential to Power in its various manifestations. We can conceive of this Force and its relation to the Power by analyzing these manifestations, but any exact definition or description of the Force (or the Power either) is impossible, because, as I said before, it is itself immaterial and, therefore, incomprehensible.

Force is not necessary in making matter. Matter is a manifestation of Power. But what we recognize in our conception of Being is a manifestation of Power *and* Force in what we call forms of energy, or the *forms* of matter, *i. e.*, the material.

It would be rather difficult if not impossible to pick out any phase or specific form of Being that was not produced through the joint effort of Power and Force. In giving a physical illustration of the relation between Power and Force it is not supposed to be comprehensive, but merely analogical.

The atom has been defined as a centre of attractive Power surrounded by an atmosphere of repulsive Force. I will try to give a conception, which I think is nearer their true relation. I will use a homely illustration, which I think will express my meaning.

If molasses is allowed to drop on a stick, a certain amount will adhere to it. If the stick is rotated, then still more of the substance will adhere to it, and the faster it is rotated the more of the substance will adhere, to a certain limited extent. If the stick is then revolved,

mass, therefore can be manifest only indirectly, is of such vital importance that the magneton should not be classed with the electron by calling it an atom; I therefore say that Force is not atomic.

it can retain on it still more of the molasses than if it were simply rotated, and the faster it is revolved, to a certain degree, the more will adhere to it. If the orbit of the revolution becomes larger, still more will adhere, and if the rapidity of the revolution and the size of the orbit are increased in a correct ratio to the rotation, a very large amount will adhere, providing it could be placed on during these motions. Now, in each case mentioned, suppose the adhering matter is the means of propulsion; then, the more molasses is applied, the faster it will rotate to its limit; then the more molasses is applied, the faster would be the revolution; then the more molasses applied, the larger the orbit; or the size of the orbit may be increased first, and the rapidity of the rotation last, or the sequence may be in any one of several different ways. In each case the proper proportion or ratio of the various movements would be maintained if a maximum amount of Force was absorbed. This is a crude illustration of the movement of atoms upon the addition of Force. Different classes of atoms have the ability according to their Desire to move differently. Some will, upon the application of Force, expend the whole of it in an enlarged orbit of revolution; others, on a more rapid revolution, and some will use a great deal on a more rapid rotation. In an increased sized orbit the effect is directly manifest and we say the Force has expanded the material; that the temperature has increased. In the increased rotation it is not immediately manifest. We would not know that there was any more Force present, if we did not know it had gone in, or if we did not see (?) it come out. Under such conditions we say the Force is latent.

Now I conceive Power as existing, so that every atom

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has related to it a certain amount of Force. The normal Desire of some atoms maintains a larger amount of the Force than others.

The Desire of each atom tends to fix a normal state for that atom; conditions modify or change that state. The Power in the atom never fluctuates, the Force related to the atom does fluctuate. The measure of this Force is such motion of the atom as is not caused by the attractive Power. From this we can draw the inference that any transformation in the form of energy within a given space is due wholly to the Force. The Desire of the atom is manifest by the way it acts under this Force. There may be an accelerated rotation, a more rapid revolution, or an enlarged or a peculiar excentric orbit, or various combinations of these motions.

We must, in getting a correct conception of the forms of energy, free ourselves from the idea of mechanism. It requires material for mechanism; Power and Force are not material. One able scientist says: "We must conceive the atoms as having *points d'appui* by which the attractive and expansive forces can maintain a hold." If it were like that, we could comprehend it, and the word "conceive" need not be used. We must be satisfied to only conceive some things. "Comprehend" is far more limited than "conceive" in its meaning; that is, we may conceive much more than we can comprehend. I have a conception of Being, but I make no pretence to the comprehension of Being. We often stretch the correct use of the word "comprehend." I may say that I comprehend that four billions is twice two billions, but I really do not comprehend at all what even one billion is. I would really mean that I comprehend that twice two is four, and conceive that it applies to

billions as well as to units. I wish to emphasize the fact that we are extremely limited in our comprehension, and comparatively unlimited in our conceptions; also that I am speaking of the *conceptions* of Being; therefore, there is no weight in the criticism, that when I mention a Force which is never materialized, I am speaking of something entirely incomprehensible.

I said I could not comprehend a billion, but I readily conceive of a billion as being a definite enlargement of a definite number of comprehensible amounts. The *conception*, to be satisfactory, must be well based on or well related to the *comprehensible*. This is the reason why mathematics is the most satisfactory branch of science,—physics occupying a middle place, with metaphysics ordinarily the least satisfactory. So unsatisfactory is metaphysics that only a small portion of mankind have any interest in it. But to this small but growing portion this interest is gratified with a greater degree of satisfaction than any other.

I have digressed in order to emphasize the point that when I use illustrations to make plain my meaning in the conceived relations of Power and Force, I do not intend by these illustrations to infer that these relations can be comprehended. They may aid you to comprehend my meaning, and get my view-point of conception, but I explicitly deny that I, as a human being, can comprehend Power or Force, or how they maintain their relations. But I do affirm that I believe that my *conception* of the relations of Power and Force is more easily comprehensible than some other conceptions, and to my mind at least, certainly the most satisfactory.

I will now get back to the work of relating the sources of energy.

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Hydrogen is supposed to be the lightest of substances; that is, there is supposed to be less atoms in a given volume of hydrogen than in an equal volume of other substance. A larger orbit of the atom with a more rapid motion is necessitated to give the required equal pressure under a less specific gravity. In a given volume of hydrogen we can readily conceive that the ratio of Power to Force is much less than in some other substances. In a like volume of oxygen of equal pressure we can readily conceive that there is a larger quantity of Power, because there is more weight and greater density. We might naturally assume that, as the quantity of Power is greater, the portion of Force is less. In such an assumption we would be wrong. As I have said before, the chances for a wrong assumption are much greater than the chances for striking the right one. A scientist will say that: "In a given volume of hydrogen there is a definite number (not definable) of atoms, with a definite motion (not describable)." What is meant by "not definable" and "not describable" is that it is not demonstrable, which limitation I accept in my conception.

I say that a certain volume of hydrogen contains a definite number of atoms (each atom a definite amount of Power), and in relation thereto there is a definite amount of Force, and this relation is shown by a definite amount of motion. Motion is the result, not the cause. Cause and effect here are co-existent; that is, they are not to be separated. As a *metaphysical* proposition, motion is never a cause, that is, one motion never causes another motion. A weight on one end of a teeter board may depress that end and elevate the other end. The motion due to gravitation may cause a motion in the opposite direction of a less weight at the other end.

This is a comprehensible *mechanical* motion. The manifestation is wholly physical and mechanical, but the assumption that the transfer of *motion* of the atom is also *mechanical* is, I think, a misconception, which I will endeavor to show as we proceed.

That motion of the atom exists is demonstrated by osmose. Two gases, we will say oxygen and hydrogen, are separated by a parchment, which is practically impermeable to the gas as a mass of material, but the atoms of the gas will gradually filter through. We shall find that (relatively) more oxygen atoms penetrate the parchment, but, on the assumption that there is more or greater motion of the hydrogen atoms, this ought not to be the fact. "But," says some scientist, "the hydrogen atoms are larger, so they do not so readily penetrate the parchment." Let us see what this assumption means. Scientists say the hydrogen atoms are lighter, and now we assume they are bigger. If one atom is lighter than another, it must be because of a less amount of the power of attraction, and if it is bigger, with the same weight, it must be less dense. If one atom is more *dense* than another, what causes it? Density, as an attribute of the atom, is a wholly inconsistent term. Density of material is a comprehensive expression and refers to the comparative number of atoms which occupy a given volume or space.

I do not conceive of any density whatever of the atoms. Density is an attribute of the material, and one atom is not material, it is *spirit*, and has *no material attributes*. This is a typical point of difference between my conception and the Materialistic conception. If the atom of hydrogen does not penetrate the parchment as readily as the atom of oxygen does, why? Unless the oxygen atom is smaller, why does it penetrate better?

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I say, because the revolution (or vibratory motion) of the oxygen atom is far more rapid, therefore, it will more readily penetrate the parchment. The expansive Force being greater, more is forced through. "But," says the scientist, "the expansive force is equal, because the pressure is equal." It is true that pressure is the only measure we have for energy, but it is known that, given two equal volumes of water of equal weight and mass, which necessitates an equal pressure, one may contain more energy than the other. Scientists admit this, but say that the energy or "heat" is latent. Now, I do not try to conceive of a latent Force any more than I, or any one of these scientists, try to conceive of latent gravitation. I conceive of Force in as constant action (*i. e.*, as motion) as is attraction, but the motion of a changing orbit is the only one that can be measured. This is what we call expansion, *i. e.*, pressure. The Force existent as velocity either of rotation or revolution cannot be measured so long as it remains such a motion of these special atoms, but when it is transferred to other collections of atoms, it may be detected. What do I mean, then, by *it* being transferred? The Force or the motion? When I have admitted that Force and motion are co-existent, it may seem a quibble to insist that it is the Force which is transferred, and not the motion.

I will repeat an illustration, now, with its explanation, which will show the deviation in my conception from the orthodox conceptions. Let us again take the vessel with the piece of coal (carbon) and a sufficient quantity of oxygen to unite with it. Through what we call combustion, the union is made. We say this union is due to chemical affinity, which is a form of attraction. There is in one or the other of these ele-

ments, or both together, a source of energy, which not only permits the motion of the union, but gives motion to the surrounding substance, which can readily be measured as expansion or pressure. Now where is the source of energy? The answer is almost unanimous, "In the coal lies the source of energy." How often have we read the scientific articles on the wonders of nature, which through ages stored up the energy of the sun through the vegetation, and hid it in the bosom of the earth as coal for the use of man! But chemists say that carbon is a substance devoid of energy, for it is insoluble in all known liquids, and at an ordinary temperature does not combine with anything. Now let us trace, if we can, the proper relation in this union of the coal and oxygen. We will take every care to be logical and consistent in the use of terms. We will agree that "energy" is a term expressive of motion of whatever kind. Motion may be atomic or material, but whatever it may be, energy is its expression. It may be manifest (*i. e.*, sensible, measurable); or it may be latent (*i. e.*, neither sensible nor measurable). We speak of latent energy, but latent motion is a paradoxical expression. To me latent is just as paradoxical when coupled with energy, as latent means quiet, without motion, and I do not conceive of energy without motion, or motion except as an expression of energy. I will use the word latent, however, because it is commonly used, but in this connection it must be understood that it means insensible, imperceptible, immeasurable (*i. e.*, not to be measured in its present condition), and not as meaning unmoving. According to this definition we agree that energy is latent in the carbon or oxygen, or both. The two unite and the energy becomes sensible, measurable.

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First, what caused the union? The natural answer is, chemical affinity (*i. e.*, a form of attraction). Where was this chemical affinity before the union began? Some one may unwittingly reply it was latent, but it is as absurd to speak of latent attraction in the chemical affinity, as it is to speak of latent gravitation. Attraction is absolute and constant. Had I the ability and patience of Newton, I feel certain that, with sufficient data, I could demonstrate that attraction no more varies in its various aspects, as cohesion, chemical affinity, etc., than it varies in gravitation because a certain quantity of gold weighs less in one location than it does in another. In asserting that in this change from carbon and oxygen to carbon dioxide there is no deviation of the quantity of attraction, I am eliminating chemical affinity as a source of energy, or at least of that energy which becomes sensible; which we say is radiated. This statement is rather iconoclastic, and will render me absurd unless I can, in a further analysis of the operation, make it appear plausible. When our chemist said that carbon is inert, and without energy, we take it that he meant comparatively. We suppose that matter in any material form is the joint product of Power and Force, which is simply saying that no material is without motion, therefore, has some energy. We have no way of knowing the quantitative value, or even the relative value, of Power and Force as a whole. In their manifestations we measure the relative value according to those manifestations. For instance, in a balance I may know that in one pan is a pound more than in the other pan, without knowing how much is in either, so when we fix the weights and measures in physics, we use them to establish definite relations one with another. In taking carbon as a substance

of no energy, I mean as a source of energy which may be radiated. Relatively, now, we say the carbon has no motion. Under the form of carbon dioxide, the carbon has motion or energy, an enlarged orbit, shown by occupying more space. If it did not previously possess it, and it did not originate in the *attraction* of either the carbon or oxygen, and came from no external source, then it *must* have come from the energy of the oxygen. This surplus energy must have been due to Force, as attraction is constant. This I conceive as being really the case. Oxygen has a great deal of energy, that is, there is much Force present in oxygen in its gaseous form, which is shown, not only in its large orbit, which makes it a gas, but in the rapidity of revolution in its orbit. Now, a portion of this Force is transferred to the carbon, resulting in an increase of the orbit of the carbon, and if this transformation of energy is insufficient to lower the orbit of the oxygen, Force is radiated so there can be a union with the carbon. The very fact of a union necessitates a close relation or synchronism of the orbits. The affinity of the carbon and oxygen, in other words, the Desires of these atoms to unite, is fulfilled when conditions are right. The *surplus* Force given up by the oxygen has gone into adjacent substances, increasing the size of the orbit of the atoms composing these substances, so that it is sensible and measurable. The old expression that this is the expansive power of heat is much nearer correct than to say that heat is only a mode of motion. When the scientist found that he could create heat, surrounded by ice, simply by motion, he took a poor screen. A lens may be made from a piece of ice and enough heat or force pass through it to set fire to any inflammable matter. In every experiment to demonstrate heat as

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a mode of motion, the motion is taken as a cause and, obviously, as motion cannot be destroyed, it follows any transfer of energy from one substance to another. The scientists see the motion of the union of the carbon and oxygen and say that this motion is the cause of the motion of the surrounding substance, which becomes hotter. The combustion is incident to the heating, but there is no more motion during the combustion than before it commenced, or after it is over. There is less motion (*i. e.*, energy) in the carbon dioxide than there was in the oxygen, and that surplus motion (*i. e.*, energy) has become measurable in the surrounding substance. The chemical affinity did not cause the radiation of this motion (*i. e.*, energy) but the union of the atoms having affinity occasioned it. (This mechanical equivalent of heat is definitely described farther on.)

I have gone at some length into this illustration, endeavoring to make plain my conception of Power and Force as separate sources of energy; that the Power is constant and never varies in one atom or another, and is never transferred from one atom to another, or from one substance to another; that Force is transferred from one atom to another, causing a variation in rapidity of rotation, rapidity of revolution, or an increased size of the orbit; that this latter variation is the only way in which such energy can be mechanically measured.

I will continue this illustration farther to more strongly emphasize my point. Without going into the subject here I will assume that electricity is the purest or most condensed form of Force with which we are familiar; by this I mean the ratio of Force to Power, subject to change, is greater in this form than any other ordinary form.

Let us take our carbon dioxide and discharge in it an electric spark, which spark contains a definite amount of Force. What may be the result? We might naturally assume that an introduction of energy would increase the size of the orbit (*i. e.*, expand the substance). So it would, if it could be introduced gradually and rightly synchronized, but time is a part of the condition which effects or alters results in every phenomenon of nature. As we know, carbon dioxide is one atom of carbon with two atoms of oxygen. (I use the term atoms here as chemists use it, to indicate combining weight.) Carbon is slow to change its state (*i. e.*, to either increase or decrease its motion); oxygen is very quick to change. (This time consideration holds good with all elements. A substance that is slow to increase its Force is slow to give it up.) This electric spark, or definite amount of Force, is delivered suddenly, and must manifest itself some way. The carbon is slow to respond, so the energy is absorbed in an increased motion of the oxygen, but not indiscriminately. If both atoms of the oxygen in the combination should increase their energy or motion suddenly, the carbon atom would have to be equally quick to maintain the relation essential to a combination, which it cannot do; or it would have to give up its motion or energy, which it needed to enter the combination, which action would be equally as quick, therefore impossible. In this dilemma one atom of oxygen in every combination or molecule of carbon dioxide takes the amount of energy to enable it to maintain its motion as oxygen in its original condition. We now have in the vessel the amount of oxygen which represents the energy existing in the spark; the carbonic oxide (*i. e.*, the remaining atoms of oxygen with its atoms of carbon), and such

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of the carbon dioxide as was not affected, the total occupying a larger volume (or with increased pressure) on account of the increased energy in the oxygen.

Continue the experiment by taking out the remaining carbon dioxide and we have left in the vessel the carbonic oxide and the oxygen. Let us pass another spark in this mixture and see what happens. It is not always possible to predict what will happen, and the calling of the chemist is one of some danger, as the result of this experiment will show. There is an explosion. After the explosion we find that the vessel contains only carbon dioxide, and if we measure the force of the explosion, we find that it just equals the energy of the *two* sparks of electricity. Now, did the union of the oxygen with the carbonic oxide cause the explosion by requiring more room for the formation of the molecules (as in a statement previously given illustrating the current theories)? Not at all. The second spark of electricity gave sufficient energy to the remaining atoms of oxygen in the carbonic oxide, to regain their original state, but it left the carbon in a state that could not be changed so quickly, also in a state that would admit of forming the compound of carbon dioxide as at first, and as quick as the condition was present, the oxygen gave up the surplus motion (*i. e.*, energy) and resumed the relationship as carbon dioxide and the energy (or really the Force, which is manifest as energy), so suddenly liberated, enters into and expands the substance surrounding it just as quickly. In the case of combustion the elimination of Force was comparatively slow, the expansion was gradual, and we called it heat; in this case the union being quick, the elimination of Force is rapid and the points of least resistance giving suddenly away, we called it an explo-

sion. Unless the weakest part of the vessel is equal to the strain, the vessel is shattered. The energy of the explosion is just equal to the energy of the combustion; although the effect in the surrounding material may be quite different.

Let us continue this line of experimenting. In a vessel containing oxygen we pass an electric spark. Now here is a substance (oxygen) whose energy is great, whose orbit cannot be enlarged in such a sudden way, and should the speed of rotation or revolution be increased, we might not be able to be sensible of it. On the supposition that our term "expansive force" is explicit, we may be surprised at the result. The volume has decreased. The specific gravity or density has increased, but as the total weight has not increased, the Force has not been inverted into gravitation. But as the substance has contracted, it certainly looks as though the Force has acted in a way contrary to its name. Let us try an experiment to see if the nature of the force *has* changed. We take equal weights of oxygen, and of this new substance (which we call ozone) and combine each with one-half its atomic weight of carbon. We get from the combustion, in each case, an equal volume of carbon dioxide. In the case of the ozone not having so large a volume we might assume the orbit of its atom not to be so large, and, therefore, the surplus energy (motion or heat) would not be so great, but we find that it is greater and the increase of the surplus energy or heat from the union of the ozone and carbon, over the union of the oxygen and carbon, is just equal to the energy of the electricity used in changing the oxygen into ozone. This experiment shows the Force is not changed in its character, that none of it was lost, and that the conception of *Force*,

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instead of motion, as the cause of the expansion (or heat) holds good. But it gives no clue to the action of the Force in contracting the ozone. As an analogy I will give an illustration to which I may refer frequently in the future, as it is suggestive of many points. We have seen a spinning top, which has a rotary motion and also at times an orbital motion. At first the orbital motion is caused by the momentum of its body after the impact. Recovering from this motion, we know there is only the rotary motion; later we see the orbital motion again and know that its rotary motion is lessening. If we impart to it additional energy (which may be done with the whip top), we see it assume the perpendicular, and lose its orbital motion. Let us assume a number of tops spinning with a certain orbital motion from a lack of sufficient rotary force. Then, if force were supplied, it would result in a decrease in the orbital motion, and if there was no friction sufficient to prevent, attraction would draw them together, and the volume (space occupied by the tops) would decrease. The contraction would be from the attraction and not from the addition of Force, and if there were no friction, this form of motion would continue until conditions changed.

Now these movements of the tops are perfectly comprehensible, and we account for each cause and effect. The modifying cause is friction, or a radiation of the energy through mechanical contact with exterior substances. But friction and mechanics do not exist as a relation between Power and Force, and taking out these terms, their movements become incomprehensible although conceivable.

I have not the slightest idea how the application of Force to one class of atoms will cause an enlarged orbit,

and to another class an increased rotation. We can see from their manifestations that various changes are characteristic of certain atoms. These changes are in many cases such as to alter the entire nature of substances. It is not at all equal as to quality of the change. For instance, in the application of Force (*i. e.*, heat) to water, during a definite time the orbit enlarges (water expands), then for a definite time the heat becomes latent (goes to increase the speed of revolution or rotation), and this process alternates always at the same definite, although not equal, intervals. Finally, the form of motion has become so different that we call the mass vapor instead of liquid.

I say that given the required condition, *i. e.*, time and force properly proportioned, the motion is according to the Desire of the atom. Materialists say motion is governed by the conditions. This is an equivalent statement, but the conception inferred is different. The latter statement supposes that mechanical laws can account for every motion, while I suppose our knowledge of the laws to be drawn from our observations of the motions whose manifestations prove to my satisfaction that they were co-ordinated by an intelligence superior to ours.

I will give a few more illustrations regarding the relation of Power and Force. If we combine the proper proportions of oxygen and hydrogen, we change a given weight of gas of large volume to a like weight of water of small volume. If this change is by degrees, we call it combustion (comparatively rapid in this case); if it is instantaneous, we call it an explosion. In either case we have released a definite amount of energy, force, heat, or whatever you wish to term it. The difference in the effect from the combustion and explo-

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sion is on account of the time occupied, as already explained. In the union of hydrogen and oxygen we find we get more surplus Force (*i. e.*, a greater quantity of heat) than from an equivalent weight of oxygen and carbon. (A pound of oxygen will radiate the same amount of heat in combination with hydrogen, but there is much more heat latent in the water— H^2O —than in the gas— CO^2 .) This is on account of two conditions. First, the hydrogen obviously has more energy than the carbon, but more important is the fact that the oxygen loses a much greater portion of its Force. In its compound with carbon the oxygen still remains a gas after some Force is expended in making a gas of the carbon, but combining with hydrogen in the form of water both are reduced to a liquid, and all that surplus energy (not really the energy but Force, the source of energy), essential to the motion of the atoms as gas is transferred to adjacent substances. Reverse the experiment and by applying Force (*i. e.*, heat) to the water we elevate it to a vapor, and by a sufficient amount of Force (*viz.*, two thousand degrees of heat) we separate it again into its constituent elements. This may be done directly by passing electricity into the water. This Force is instantly absorbed in changing the water into gas. This is one of the most simple illustrations showing that heat and electricity are manifestations of the same Force. Continuing this line of experimenting, we find that an equal amount of oxygen will release or radiate about twice as much heat when combining with anything, in which it takes the form of a solid, as iron, zinc, etc. I do not mean by this that the entire amount of surplus Force liberated is from the oxygen, for no doubt there is less Force in the iron, zinc, etc., as it exists in this new form of oxide.

I will take up one more substance in its relation to Force. Nitrogen constitutes four-fifths (approximately) of the mixture we call air, the other fifth being oxygen. Nitrogen in the air is called passive, neutral. Nitrogen in this form as a gas is inactive, that is, it does not unite easily with other substances. That it does not possess as much Force as the oxygen is shown by the fact that, when liquid, it volatilizes much quicker under the same conditions. With some few substances, such as boron, titanium, magnesium, etc., it unites in combustion, giving up the Force which makes it gas (radiates heat), and as a part of such compounds, it is very stable and non-volatile. But the characteristic which renders nitrogen a wonderful and valuable element is its ability or desire to change its condition and retain all of its Force, with additional Force added. We saw how by the addition of Force (electricity) to oxygen, its volume was reduced, and it became in this new condition what we call ozone, possessing more Force in proportion to its weight than it did as oxygen. In connection with nitrogen, oxygen may be condensed to an even greater degree, but the ability to be so condensed is undoubtedly by virtue of the nitrogen Desires, for nitrogen will condense in this same manner with other gases. Take a vessel containing nitrogen and oxygen (air) and pass into it an electric spark, and the two gases combine, but the combination is much different from that resulting from the union of the oxygen and hydrogen. In that case there was an explosion or combustion, with an elimination of Force; in this case there is an absorption of Force. In the case of hydrogen and oxygen one spark of electricity or fire would give a kindling point, and the whole volume, no matter how great, would combine spontane-

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ously (spontaneously in this connection usually means starting without external means, but I mean here that it continues without external means), but with the nitrogen and oxygen, nitric oxide is formed only so long as the sparking continues, *i. e.*, proportionately to the Force introduced. With the electric spark in water, the Force raised a liquid to a gas, but in this combination we have the Force turning the gas to a liquid (in combination with water it is the liquid "nitric acid"). We have a right to expect this liquid to possess characteristics different from water, as it must possess much more Force. A simple experiment will show we are correct in this assumption. Place some of the nitric acid on any combustible substance and a union occurs with its elimination of heat or Force. I wish to emphasize the point again that the heat arises not from the union or combustion, but from the elimination of the Force existing in this case in the nitric acid, which Force is not essential in the new combinations.

Nitrogen as gas possesses the ability, under the proper conditions of access to Force, to condense even to a solid, and the many nitrogen compounds are the greatest source of energy in plant and animal life. This energy is not from the *union* of the *various* elements, but from the ability of the nitrogen to quickly change its form through an absorption or elimination of the Force, *i. e.*, by changing the manifestation of the Force from a rapid rotation to an enlarged orbit or vice versa.

We assumed in the analogy of the top that a decreased size of orbit was caused by an increased speed of rotation; this speed of rotation might be increased indefinitely, and it would be directly immeasurable. If, in the case of the tops rotating rapidly, we could knock them over, all the energy of the rotation would go to-

ward an enlarged orbit; the tops would scatter. If, in solid form, nitre is nitrogen with a restricted orbit and an intense speed of rotation, and if, as in the explosion of gunpowder, this form of motion was quickly reversed, would not that account for the explosion?

We will find that in all explosive substances some one or more of their elements are condensed, *not by a release of the force*, but with an *absorption of the Force*, that is, the condensation has been endothermal instead of exothermal. Of all *common* substances nitrogen possesses the Desire or ability to so concentrate its Force in the greatest degree. Uranium, radium, etc., substances more rare, seem to possess this ability to an even greater degree.

I will give a brief synopsis of this conception of Force. Each atom of Power possesses the ability, according to its Desire, to maintain a certain amount of Force, which varies according to conditions. This Force may be assumed to be manifest in the changed movements of the atoms, as rotation, revolution, size and excentricity of the orbit. The Force is always proportionate to these movements and coexists with them. Upon the transfer of Force from one atom to another the portion of motion is transferred. Force is always *transferred*, never *transformed*; the resulting motion and energy may be transformed.

Atomic motion, as rotation and revolution, is immeasurable, incomprehensible, but conceivable. An aggregate atomic motion becomes mechanical, measurable only by an enlarged orbit of the atom. The result of atomic motion or variation in the atomic motion may be sensible, but to become measurable it must become mechanical (measurable meaning by means of instruments, physical or chemical).

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In the relation of Force to the atom (*i. e.*, a specific amount of Power), there is no such thing as friction, momentum, or mechanics. Eliminating these or any other material attributes from our conception of the relation of Force to Power compels us to admit that such relations are then utterly incomprehensible. But, we as human beings, are incapacitated from comprehending anything but what is sensible on the material plane.

CHAPTER XI

THE SENSES

FROM the foregoing chapter on Force one might conclude that Force was the chief source of energy. When I said that chemical affinity in combustion did not cause the radiated heat, and when I said that the Force existing with the various forms of nitrogen was the chief source of energy in plant and animal, it certainly seemed to leave a small part for the Power. This is indeed the trend of many scientists at the present day; that is, to resolve all phenomena into electrical terms, making ions and electrons synonymous with Force, and assuming them to be the fundamental elements of the atoms.

While we are without measure of the absolute relative value of Force and Power, I am inclined to think that Force is of secondary value, and as a whole is controlled by Power. It may be that the reader does not clearly grasp my meaning when I say that Force is never manifest except through Power, and therefore is never by itself mechanical. Mechanical action necessitates material, and Force is never materialized. Hoping to make it a little clearer I will give an illustration to show the difference between a transfer of Force and a mechanical movement. Let us take two bars of equal length and size, one of copper and the other of iron.

Let us fix stationary one end of each, and at the other end put instruments to test any variation in conditions arising from our experiment. We will place at the centre of each bar an equal means for heating them. What is the result? The copper bar exhibits the effect first, the thermometer at the end shows an increased temperature. The next effect is on the iron bar, the pressure needle shows the bar has expanded. The instrument at the copper bar shows no expansion and the instrument at the iron bar shows no heat. Here are two different effects from the same cause. Let us analyze the action and see if we can see, inferentially, the *modus operandi*. The copper bar is slow to heat, that is, the orbit of its atoms increased in size slowly. The Force is used in an increased speed of the revolution. This Force is transferred quickly from one atom to another until it reaches the end of the bar, it is there shifted to the mercury of the thermometer, or our fingers, and this Force is utilized differently by the mercury, and our fingers, to what it is by the copper atoms. The Force, when transferred to the mercury or fingers, causes an increase in the size of the orbit, *i. e.*, an expansion, which we call heat or temperature, but this heat or motion would have been impossible of discovery directly in the copper. We discovered it, not by any mechanical or material difference in the copper, but by the Force which issues from the copper and acts on the thermometer and our fingers in a measurable and sensible way. This Force passes rapidly through the copper or from one atom to another from the source of the Force (*i. e.*, heat at the centre of the bar), and on account of this rapid transmission we say that copper is a good conductor of heat. If there is something at the end of the bar, like water, which is a good

absorber of heat, it would be impossible to heat to any great degree the copper bar itself, provided, of course, the amount of the heat was proportionate to the size of the bar. If more heat was applied than could be transferred by an increased speed of revolution, it would be manifest in an increased orbit, and we would have the measurable expansion of the bar.

In the iron bar the heat, *i. e.*, Force, is directly used in an increase in the size of the orbit, which is soon noticeable and measurable. Atoms requiring more room in their enlarged orbit push back the adjacent atoms, and the extreme end of the bar is moved. The instrument shows the end move, although there is as yet none of that specific Force near the end, and our fingers and thermometer are not effected. This mechanical motion is only possible on account of the attraction as cohesion, which maintains a solidity of the material of the bar. Force becomes measurable only when it is manifest in an increased size of the orbit of the atoms, and it is by such expansions that we say motion becomes mechanical. The Force does not become mechanical, but the manifestation of the Force (increased size of orbit of the atom), being measurable, does become mechanical. The results of the Force, as increased speed of revolution or rotation, are immeasurable so long as they remain as such atomic motion. A small portion of the Force in a given body may be *transferred* and the motion *transformed* into a measurable form, and we may compute the Force innate in the whole. Such kind of measuring we do with certain meters.

I will mention one other contrast in the action of the two bars. The copper heats slowly; therefore cools slowly. It will be hot to the touch long after the iron is cool, for the iron heating quickly will cool quickly.

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This time consideration holds good of all materials in every instance. If I am asked why the atoms of copper act differently from the atoms of iron under the same conditions, I reply that the normal atomic motion varies according to the Desires of those atoms, and the manifestations of these Desires are given expression in their motions, which characterize the various elements and compounds.

An analysis of the senses and to what they are sensitive will make us more fully realize that all we know directly of the Power is the variation of the motions of the atoms, and *that* knowledge reveals to us what we know of the Desire, which is manifest in the forms through which the atoms materialize.

The sense of touch or feeling is the first of the senses. It is the most vague. Development is always from the vague to the definite. This sense of touch or feeling is transferred by nearly all the nerves of the body, and is interpreted to consciousness in many different forms. Primarily and in the ultimate, nerve is not necessary for sensation of touch or pressure, and it must be *pressure* or resistance to its motion, of which every atom is conscious. As the atoms combine into molecules and organize into particles, the pressure or resistance must vary, and the interpretation of these varying pressures enable these atoms to act automatically in the spontaneous manner in which they do, and for which mechanics can give no satisfactory explanation. The senses of taste, smell, hearing, and sight are but specialized developments of the sense of touch.

Taste is the first sense to be specialized, and this specialization occurs with the very earliest forms of organic life. The organism must know what to accept and what to reject as food, as a first step in the process

of assimilation. In the most minute forms we see that this knowledge exists, and must come from the sense of taste. In all these lower forms, as also in most vegetable forms, the food comes to the organism instead of the organism going to the food, and when the contact comes, the sensation of what is acceptable is certainly a sense of taste.

As the organism develops to higher forms, it begins to move, and henceforth touch and taste are not sufficient. There must be a sense that will tell it *where* to go for food, therefore the sense of smell is developed.

In the still higher stage of development, when fecundity will not protect sufficiently against possible extermination, the sense of hearing is specialized to enable the organism to guard against the approach of an enemy.

The sense of seeing follows soon after, and in some varieties probably evolves even before the sense of hearing.

The foregoing is an assumption of the development of the senses, which is not meant to be applied literally to each special development, but as a rule it holds good of natural forms in general.

It is not meant that the nerves or organs of the senses are, in other organisms, just like they are in the human being, but that the classification of the effects of sensation and their perception in all forms of Being known to us come naturally under these heads.*

* The tendril of a vine may reach toward a projecting nail and if the position of the nail be changed, the tendril will, after an interval, change its direction toward the new position of the nail. This may be repeated so frequently as to preclude any idea that the change is due to a coincidence. This is only one illustration of many that might be used to show that it would be difficult to classify exactly the sense of the lower order of plant and animal.

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The keenness of perceptions by any of these senses vary greatly in all organisms, even that of the human being, but the higher specialized forms have proportionately greater specialized organs of sense.

The sense of touch is practically co-extensive with the form. The sense of taste is the more confined or limited, proportionate to the development, but even in the human being the nerves of taste extend over the tongue and part of the palate, and the different parts are sensitive to only certain tastes; one part is sensitive to sourness, another to salt, etc.

The sense of smell is concentrated to less surface and is affected by more delicate impressions.

The sense of hearing is still more highly specialized and the organs more elaborate, though the nerve termini cover even less surface. Still the sense of hearing may be effected by impressions, other than those entering through the auricular orifice, as we can perceive by holding a resounding body in the teeth.

The sense of seeing reaches the maximum of definiteness, being able to locate the object of sensation with far greater accuracy than the senses of smell or hearing. The organs of sight are highly specialized, and no other organ can in the slightest degree be sensible to luminosity.¹

I assume that all of the organs of sense are impressed by motion, and perceive the variation of motion; that the senses are specialized to receive each its special variety of motion.

¹ That the primary origin of the sight organ is probably due to actinism in no way invalidates the fact, that the human eye is more sensitive to luminosity than to actinism, and that any physical or chemical phenomena due to light may be performed by calorific or actinic rays in the entire absence of luminosity.

We will agree that touch, as a sense, is impressed by motion, or by pressure, which is the same thing in the ultimate, being resistance to motion. The relative value of motions is interpreted in various ways by the different nerves of touch. They are all vague and give relative qualities only. If we take our hands, one from cold water and one from hot water, and put them into water of intermediate temperature the water will feel warm to the cold hand and cool to the warm hand. This is an example of what I mean by relative values. Consciousness perceives the relation only. Appetite and pain are each due to the sense of touch, but they apparently have little in common.

I have previously said that in sound and light there is no measurable amount of energy. I will assert that no measurable amount of energy is necessary to impress any of the senses. I will illustrate this statement as I proceed. You may think that it is easy to measure the energy of a blow which we feel. That is true, but we may be more sensitive to a light blow than a heavier one. The sensation even of feeling does not truly measure the amount of energy concurrent with the impression. Many of the nerves of touch are developed so they are a measure of certain forms of energy, but we can feel many forms which are measurable in no other way except by the sense of touch. I may enjoy a good appetite or suffer from the pangs of hunger. The desire for food which I feel in each case is the same, except in degree. No mechanical instrument will measure the relative degree of difference.

Advancing to the sense of taste, and we have an example which brings out the point more clearly. Take the oil of lemon and let it stand in the light and it will turn to oil of turpentine. There is no measurable

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change which the physicist can detect, but our sense of taste shows a difference. There certainly is no difference in the elements of the substance, therefore the only difference there can be is in the form of the motions of its atoms, and this, while perceptible to taste, is measurable in no mechanical way.

Take hydrogen as gas, liquid, or solid and it is not sour, yet everything sour owes its characteristic to hydrogen. If the hydrogen is not sour, the sourness must come from a change of motion essential in the formation of its various acid compounds. This changed motion is not measurable, that is, the orbit of hydrogen is not measurably different in the acid from what it is in water.

This same test and example holds good in the sense of smell. It has been supposed the sense of touch was impressed by a definite degree of pressure, and that taste was affected by the contact of solid particles and smell by the contact of the lighter particles or corpuscles. The corpuscular theory has been discarded as the theory for sound and light, but is still retained for smell. The old stock illustration of the divisibility of matter, is the particles of musk which expels its odor carrying particles for an infinite time without any noticeable reduction in volume. Even on the corpuscular theory it must be admitted that the size of the corpuscle is immeasurably small. But the corpuscular theory is not correct. The sense simply detects the variation in orbital motion.

Let us take the example just given, and see the real process of transmission. Musk, as well as other pungent odors, has a nitrogen element in its compound. In all such compounds nitrogen is unstable and volatile, that is, it is relatively easy for it to change from its

condensed condition to its original gaseous condition. And this process of changing its form of motion, or variation, is what the sense of smell detects. The motion is still characteristic of the compound, and the variety of motions gives variety of odors. There is one other point which may be brought out here. We saw in a previous illustration that in condensing, nitrogen absorbed much more force than it normally possessed; in returning to its gaseous state, this force is radiated and the immediate effect of this force is to give the same characteristic motion to the mobile atoms which compose the atmosphere. In this way the odor might be transferred and be detected without a particle of the *original* substance entering the nostril. Hydrogen, in condensing, does not absorb additional force as nitrogen does, and the odors caused by the return of hydrogen from a condensed state to a gaseous state we aptly characterize as heavy, dead, noxious. Odors from putrefying organisms are chiefly from the hydrogen element. Hydrogen has neither taste nor odor, it is a variation in the orbit of its atoms,¹ which we detect through our senses, and these variations are measurable in no other way.

Oxygen is without odor but ozone we say has odor. This is solely because it is unstable and we, by the sense of smell, detect the transformation of the ozone to its enlarged orbit as oxygen.

Sulphur we say has odor, but sulphur may exist in at least three different and distinct forms. It is only when changing from one form to another that the odor

¹ It is probable that I err in speaking of an atom of hydrogen or oxygen as much as one errs in speaking of "an atom of water." The recognized "elements" form our present limits of divisibility and are used as the only means of necessary illustration.

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may be detected. It is the peculiar *form* of *motion* and not the *element* which we detect through the sense of smell. *No element has odor while in a stable and intransitory form.*

It may be said that litmus paper will detect acid when the tongue will not. This objection would show the incorrect conception of sense. It might be as reasonably objected that because I cannot understand music, therefore my eyes are not as good as another person's. I want to emphasize the point that our senses detect only variations in motion, and that the minimum of *these* variations are not measurable. The senses are no measure of *absolute* values. It is through *experience* that we are able, by the use of our senses, to judge of values. A farmer may judge by sight the weight of a hog, but we know that sight does not give weight, neither does the sense of touch. It is only by experience that we judge of weight, *i.e.*, value of pressure, by touch. Acids have a certain value, that is, can be graded mechanically, but the sense of taste is no measure of that value. While sourness is a characteristic of acids in general, it is not an essential. Of two solutions equally acid one might be sour and the other not, and while there would be a sensible difference to taste there would be no measurable difference.

All of the foregoing examples and illustrations of the senses are but to emphasize the criticism herein made of the current theory of sound and light, and to make apparent the correctness of my own theory.

In the development of the senses from the vague sense of feeling to the higher specialized sense of taste, we see that the amount of energy required to impress the sense decreases. In a dilute solution of quinine the particles of quinine which affected taste would be too minute to

affect any nerve of touch. In the odor of the musk, the refinement of motion would be such that it could not effect taste. Or to put it in a parallel way: the amount of hydrogen that might be detected in odor would be insufficient to be detected by taste in acid, and even a less portion than would hydrate substance enough to affect smell, would be visible in a luminous spectrum by its variation of color, or be visible in an actinic cloud. While in each case the quantity is immeasurably small, still by the quantity present in the compounds used, we might know the comparative quantity necessary to affect the various senses.

We see it so frequently stated that a specific amount of energy is necessary in order to be sensible to us. Let a quart of water absorb sufficient heat energy to raise its temperature one degree, we can neither feel it, smell it, hear it, nor see it, because this amount of energy is not in a *form* to impress the senses. But this amount of energy might, in a different form, affect the senses. We may measure the minimum amount of energy which we can *transform* in order to excite the sense, but we cannot measure the *minimum* part of the amount of this energy which is necessary to affect the sense.

Under the current theories of the senses, mechanical pressure for touch, molecular pressure for taste, and corpuscular pressure for smell, there is an acceptance of the idea of a diminishing degree of energy necessary to impress the sense. We agree on this part at least. Now, would it not be logical to think that in the next specialized sense, which is hearing, that there would be still less energy required to impress the sense? It would certainly seem so, yet in the quotation given in a previous chapter we see a comparatively enormous amount of energy is required to impress the sense of

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hearing. "In the faintest audible tone the total energy required to set the tympanum of the ear in vibration is $2.2 \mu\mu$ mg."¹ There we have authorities giving not only a measurable quantity of energy, but the *least* quantity of energy by which hearing can be affected.

When Tyndall said that a deaf man might put his hand in a bell and *feel* the sound, he might also have said that a man without the sense of taste could put his hand in acid and feel the sourness; one statement is as apt and true as the other and exactly parallel.

I assert that it takes even a less amount of energy to affect hearing than to affect any of the previously evolved senses. In other words, the organs of hearing are constructed to detect slighter variations in the orbit of the atoms than are the organs of taste or smell. If we take an iron rod or wire one hundred feet long and hold one end in the teeth, let the other end be scratched or tapped with a pin, the sound is distinctly audible. If the scratch was in the centre of a ball of iron one hundred feet in radius, it would be heard equally as plain at any point on the surface of the ball as at the end of the rod or wire. The fact that sound will be transmitted better through air enclosed in a pipe is due to the fact that the vibrations of the air are confined by the more dense substance, but this does not hold good of the wire. According to the current theory of sound, the energy of the scratch would not only have to be enough to set in vibration all the supposed tympanums that might surround the ball of iron, but set in vibration as well every particle of iron in the ball. We will admit that the energy of the scratch can be measured and designated by figures, and from these figures, according to the current law of the intensity of sound,

¹ *New Psychology*, page 325.

we could determine the amount of energy at a given space at the circumference of the ball, which space might equal the size of the tympanum of the ear. I have no idea the result would indicate near so much as the figures given as the minimum of energy required for sound, and I am satisfied that the amount would be immeasurable. In other words no instrument or means at the command of man could *directly* measure or indicate that there was any motion or other effect of one end of a wire one hundred feet long if faintly scratched at the other end.

I will express this idea in statements acknowledged by physicists but not generally recognized.

Many forms of energy can be measured mechanically which are not directly perceptible to the senses.

Many variations in the sensible forms of energy may be measured mechanically when too minute to be detected by the senses.

Forms of energy may exist in such minute quantity as to be sensible, yet not directly mechanically measurable.

The difference in these last two statements expresses the difference between measurable and sensible, between mechanical motion and atomic motion, between the materialization and manifestation, also, I might say, between the material and the spiritual.

Our senses are the connecting link between the *unconscious objective material* and the *conscious subjective spirit*.

Our senses, including the organs of sense, are the result of an atomic organization whose function it is to interpret to the Ego certain forms of energy or atomic motion and this function can be performed by no machine made by man.

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From molecule to man is a complex development, but it is a development of complexity only. The physical ability and mental comprehension is one solely of degree. The continued development of this function in man we call experience, reason, knowledge. This development is not of the Ego, or soul, or spirit, but of the body and brain; a machine not made by man but by the Spirit in man.

CHAPTER XII

SOUND

MY theory of sound and the transmission of a sound-wave is based on "atomic motion" instead of "mechanical motion."

I assume that the variation of the size of the orbit of the atoms of any body may, within certain limits, be perceived as sound. The amount of variation impresses us as intensity. The number of atoms from which a variation initiates we interpret as volume. The frequency with which these variations occur we perceive as pitch.

The energy of the abnormally large orbit is transmitted to adjacent atoms. The velocity of this transmission is proportionate to the speed of the revolution of the atoms of the *transmitting* medium; the closeness of the atoms (density of the medium); and the ratio of Force to Power (as temperature) which might change the speed of revolution of the atoms of a given medium.

I assume the atoms to be in constant revolution. The transmission of a sound-wave is the transmission of the variation in the size of the orbits of this revolution. It is, therefore, atomic and in no sense mechanical.

I will refer again to the illustration of the spinning tops. Let us assume an area filled with tops without

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motion, another area of tops whose rotation is not sufficient to prevent a certain degree of orbital motion with just sufficient space between them for the orbit. Now, with a definite degree of energy, insert a stick in the centre of the area of motionless tops. The resulting movements of the tops would be proportionate to the energy necessary to insert the stick. That is, the area of the tops would have to be limited to a quantity that could be moved by the definite amount of energy used in the movement. The absolute lateral motion of each top in the circumference would be much less than the motion of the tops adjacent to the centre. This relative motion could be accurately computed according to the law applicable to such cases (inversely as the square of the diameter). This illustration is quite an accurate analogy to the current theory of sound. It is asserted that the energy producing the vibration lifts the air and that the effect at any given circumference, sensible as sound, is computed by the same law as that just mentioned. That the lifting is done by steps, *i. e.*, by condensation and rarefaction, makes no difference as to the actual amount that must be lifted, or the distance (amplitude) which that amount must be lifted to affect the tympanum. The only difference is the time consideration; and as the air must be lifted through a definite space (amplitude) at the rate of over one thousand feet a second, the time consideration does not materially affect the analogy.

I will take the second area of tops for the analogy of my theory of the transmission of sound. I have assumed in the conception of the relation of Force to Power that each atom has a rotary and revolutionary movement of which these tops may be an illustration. If we insert the stick in the centre of the area of spinning

tops with just the same amount of force as required before, we find a different result. The immediate effect would be to check the rotation and thus indirectly to increase the orbit, which would be repeated in turn until it reached each top in the area. At the circumference of the area, how would the lateral motion of a top compare with the lateral motion of the outside top in the first illustration? We can readily perceive that it would be greater. We would, therefore, be enabled to enlarge our area of tops and yet get the same effect or degree of lateral motion as we did in the first case. Now this is much different from saying that we get an increased amount of mechanical energy. There is really no more energy expressed in the second case than in the first. If I wish to demonstrate ocularly, lateral space, I could, by passing a shadow through that definite space, do so with much less expenditure of energy than by passing a substance through that space. So to a certain degree can sound be affected with less expenditure of energy by a deviation of the orbit of a moving atom than by moving that atom the same distance laterally.

I might more definitely illustrate this by taking two suspended balls in contact. I put a stick between them, and a certain amount of energy is required in addition to the energy of moving the stick, which amount is the energy required to move the balls. Now suppose the balls separated and to be revolving with scant contact as their orbits coincide. Now we can insert the stick with less necessary energy than before, as we do not have to move the balls. As the balls come in contact simultaneously with the stick the lateral effect is greater than before, with less expenditure of energy on our part. In further experiment we would see that

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the effect on the pendulums was not dependent upon the insertion of the stick, excepting as to the size of the stick, but to a greater degree upon the quality or composition of the stick, and to the greatest degree upon the speed of the revolution and size of the orbit of the balls.

The intensity or carrying quality of sound does not depend upon the energy used in producing it. More energy is required to beat a base drum and blow a tuba than to beat a bell or blow a whistle, yet the bell and whistle may be heard to a further distance. In our illustration of the revolving balls, I said that the energy necessary would be in proportion to the size of the stick used. So in sound, the energy used is in proportion to the amount of air lifted, but this has but the slightest part to do with the sound; it is a necessary mechanical operation in connection with our production of various kinds of sounds. This required energy is in proportion to the surface of the body vibrated and amplitude of the vibration, quality of the body being equal. But it is never the vibrating *body*, and frequently not even an *atom* of the first vibrating body which gives the sound. We draw a bow across the strings of a violin, and we hear sound which the authorities say is produced by the vibration of the strings; but suppose the body of the violin should be rubber, the energy and vibration of the strings is the same, but what kind of sound do you get? When we play a violin we vibrate the strings. Our required energy is proportioned wholly and solely to the surface of the vibrating strings (weight of bow and reaction of the resonant body not considered) and the speed of their vibration, and that may be, as in the case of the rubber body, as great, but with little sound. Ordinarily this vibration is transferred by mechanical

contact to the resonant body of the violin. As I said in the illustration of the revolving balls, the *quality* of the stick has more to do with the sound than the energy of lifting the stick; and in producing sound, the quality of the resonant body from which the impulse issues, is represented (in my illustration) by the "quality" of the stick. A correct idea of this point is of great importance. A resonant body can be set into vibration with much less energy than an inelastic body. Imagine trying to give the bugle calls on an instrument of lead. While the sound to a great extent depends on the resonant body as a whole (a cracked cornet would give, energy being equal, a less volume of sound, and a less pure tone than a perfect one), yet the sound is not from the vibrating *body* or even the visible internodes in the *body*. This vibrating body mechanically vibrates the air, which I acknowledge can be felt by a deaf man, and these air vibrations are those used in the illustrations in text books on physics. The *mechanical bodily* movement of the air does not cause the sound. It can be demonstrated that the mechanical movement of the air varies more in its velocity than the variation of sound; that is, the velocity of the mechanical movement of the air is greater in proportion to the intensity of the vibration and decreases in proportion to the distance, while the velocity of sound-wave varies but slightly according to the intensity, and there is practically no variation in its velocity according to the distance.

In the phenomenon of the sound-wave there coexist two distinct forms of motion, the mechanical and the atomic. It so happens that in air these two motions are transmitted with a velocity so nearly equal that it has permitted an acceptance of the theory that they

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are one and the same. The confusion of the phenomena characteristic of each causes all the inconsistencies.

I will give several illustrations regarding these phenomena. When we have an explosion in the air, such, for instance, as results in a clap of thunder, there are several effects, two of which I will mention here:

1. The adjacent air is compressed and is mechanically forced back and this condition is transmitted as a condensation, followed by the necessary rarefaction. This travels in much the same manner as the orthodox theory of sound. But its velocity is, to a certain extent, proportionate to its intensity and decreases with distance and cannot, with an equal amount of energy similarly utilized, be transmitted as far as sound.

2. The atomic variation which we perceive as sound.

The first effect, the mechanical compression of the air, is perceived as a shock, a jar, sometimes shaking the windows. This may come (at a half-mile distance, let us say) fifty to one hundred feet *ahead* of the sound, and (at a mile distance, we will say), fifty to one hundred feet *behind* the sound, which would mean that, in a mile, there would be a variation of a tenth to a fifth of a second.

Tyndall^{*} gives an experiment where a series of explosions are so rapid as to cause a musical sound, and says: "The sound of this tube becomes powerful enough to shake the floor and seats and a large audience that occupies the seats of this room."

This tube could have been muffled so that very little sound would have been heard and the audience would have been shaken just the same, or the sound could have been intensified and no shaking at all effected.

^{*} *Sound*, page 264.

And yet this authority on sound ascribes this phenomenon to sound.

We have all heard of the bridge that might, by the synchronous tramp of men, vibrate to the breaking point; we have all heard of an explosion that would shake a room, but did we ever dream that sound in either instance did the shaking?

The discrepancy in velocity of the two motions is easily perceived and corrected in arriving at the proper length of organ pipes. Frequency of vibration is interpreted by our sense of hearing as pitch. Frequency of vibration divided into velocity gives wave-length. The length of the organ pipe proportionate to its diameter is supposed to regulate wave-length, therefore pitch. This length is figured by physicists, but the figures do not agree with the facts. The actual length of an organ pipe necessary for a given pitch is found empirically and varies from the theoretical length all the way from a fraction of an inch to several inches. This is because the velocity of the mechanical movement and the velocity of the transmission of the atomic movement are not the same.

By an illustration it is easy to show that the *sound* is from the transmission of *atomic motion* instead of from the mechanical movement. Let us take a tube with a plunger. Shoving the plunger into the tube we condense the air and the effect is perceived at the other end. The experiment will quickly show that the velocity of the transmission of this condensation has a certain ratio to the velocity of the movement of the plunger. That is, the *velocity* of the *transmission* of the mechanical condensation is changeable according to the initial movement. The velocity of the transmission of the atomic motion, or sound-wave, is not

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changeable by the initial movement. It is plain that if the sound of the pipe organ depended on the transmission of the mechanical condensation and rarefactions of the air within the pipe, a quicker injection of air into the pipe would change the time as well as the intensity, and under those conditions time could never be maintained in the music.

This difference is much more easily observable in water. If we hit the surface of water with a stick we cause the two distinct effects; the first one is visible as a mechanical movement of the water in waves, the other is a variation of the vibratory movement. When stick and water come into contact this vibrating movement may be heard at some distance, first by one ear in water, and next by one ear in the air, according to the variation of the velocity of the transmission in these different mediums. An equal sound effect may be produced by exploding a small fulminating cap at the surface of the water, but there would be comparatively no *mechanical* effect on the water.

In the generation of a sound-wave, certain of the extreme atoms in the internodes of the vibrating body attain an orbit sufficiently different from the normal to effect what we call sound. These could effect the orbits of the surrounding atoms and cause a similar deflection, as the stick would effect the orbits of the balls. If these *surrounding* atoms moved with a greater or less rapidity, the transfer would be more or less rapid; accordingly, the velocity of sound will depend on the *velocity* of the revolution of the atoms of the surrounding or *transmitting* medium (elasticity), as well as on the *size* of the orbits of the atoms of the surrounding or transmitting medium (density).

This conception of the variation in the size of the

orbits of the atoms and the speed of their revolution would easily account for the variation in the velocity of sound in gas, liquid, or solid, or in the various forms of substances in these various conditions.

A sudden expansion of the body vibrating would have the same effect on the surrounding revolving atoms as a solid stick would have if inserted so as to conflict with the orbit of the two swinging balls.

The cause of sound then, according to my conception, is a variation of the atom from its normal orbit, which variation, within certain limits, we perceive by the organs and nerves of hearing, and by them is transmitted and interpreted to the consciousness as sound.

Now, as to the perception of these variations. It is the current theory that the tympanum of the ear must, by the air waves, be bent "once in and once out" to make a sound. I say, the tympanum is not at all essential to the perception of sound. Any one can easily find by trying that sound can sometimes be perceived by touching a vibratory medium with the teeth, when these vibrations are insensible through the ear. We have an epidermis, but it does not aid the sense of touch. The tympanum like the epidermis is a guard or protection. It vibrates whenever there is a mechanical vibration of the air sufficient to vibrate it. If it were not for this protection the delicate nerves of hearing would be impaired, as we find when from any cause the tympanum is destroyed. But the destruction of the tympanum will not destroy utterly the power to hear, and the vibrations transferred from contact by the teeth will still be perceived, but from lack of constant practice the perceptions thus received are not so well translated or interpreted.

The wave theory necessitates a mechanical move-

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ment of the air, not a movement of the atoms singly, nor a molecular movement of whatever description, but a movement in mass in quantities sufficient to embrace condensation and rarefaction, and with force enough to mechanically move the tympanum. According to my idea, sound may be heard, and in most ordinary cases is heard, without any vibration of the tympanum as a whole. There is continuous atomic or molecular movement of the tympanum of the ear, in common with all bodies, which, when the sound enters that way, is, according to its thickness, a proportionate part of the medium of the transmission, and, as a constant medium, is part of the normal conditions. When the tympanum is changed by inflammation or any cause it changes the normal condition of our hearing, because the movement of the atoms and molecules which compose it are changed.

Now regarding the intensity of sound. We know one mosquito sounds louder one foot away than one hundred mosquitos ten feet from the ear, and that one hundred whistles ten feet from the ear sound louder than one whistle one foot from the ear. In each case they ought to be equal according to the law given by the physicists.

It may be asserted that in the illustrations I have given, it is volume of sound that has increased and diminished. This is true, but mechanics does not discriminate. If we increase a given sound ten times, there is no comprehensible mechanical way of telling whether we have ten times the intensity or ten times the volume. Our organs of hearing can interpret whether the orbit has increased in size or whether more atoms have an enlarged orbit.

Scientists prefer to depend on a law mechanically

correct than on an interpretation by the ear. Our interpretation of the intensity and volume of sound comes from experience, but even if our interpretation was perfect, in order to know the correct law of the intensity of sound we would have to have data on all the essential parts to the phenomena, none of which are absolutely constant. We would have to know the structure of every vibrating body; to know the rate of revolution and size of the orbit of the atoms, which affect the quality of the sound; the various movements of the atoms in the structure of the medium which transmits the sound; the proportion of Force to Power, and their relation in all of these atoms; and finally, the conditions of the organs of hearing.

It would seem that the tendency of the organ is to minimize intense variations and magnify slight variations. In other words the sense of hearing is so delicate that we recognize the variations in the lower register more readily than those in the higher. This is true of all other organs of sense. We notice the variation between nine and ten quicker than proportionate variations between ninety and one hundred.

The experiment of the singing flame, etc., ought to prove the undulatory theory incorrect. The slightest variation of the motion of the air will cause a flame to flutter, but in these experiments the *flame* does not directly flutter, and is not affected at all except indirectly from the effect of the variations of the vibration at the *vibrating point*, that is, where the gas issues from the orifice, and this vibration can be regulated so as to correspond to some one of many variations. In any text-book on sound we may see the cut of the tuning-fork carving the air into sound-waves of condensation and rarefaction. Holding the tuning-fork near a flame,

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we see the mechanical effect of this mechanical wave in the fluttering of the flame, but carry the tuning-fork farther away and the flame is not so affected; the mechanical motion has decreased according to the law, which is erroneously called the law of intensity of sound. The flame, or smoke jet, or water jet, may be affected from a still greater distance, but it is affected by the synchronous vibration of its most intensely vibrating part, and not directly affected at the part most sensitive to mechanical air waves.

Scientists wonder why people still submit to be lead by the traditionary dogmas of religion. It seems equally as wonderful to many why some scientists still conform their opinions to traditionary theories, when a little thinking ought to convince them that some of their theories are not consistent with facts.

I might call my theory of sound the revolutionary theory, because I conceive impressions of sound to be caused by a variation in the orbit of the revolutions of the atom, rather than mechanical waves in the substance.

I might go on at length and show how in each phenomenon this theory of variation in atomic vibration is more nearly consistent with facts than is the wave theory, but I think enough has been said to give one an idea of the theory, and to aid in forming an opinion of its worth. But bear in mind, our opinions, one way or another, will not change the facts, whatever they may be.

CHAPTER XIII

LIGHT

IT is admitted that the undulatory theory of light is based on the same claims as the undulatory theory of sound. If that theory of sound is weak in any of its claims, that of light is still more so, as it has the added weakness of necessitating in its theory the addition of a suppositional medium which is called ether. Ether, as defined, is not a demonstrable substance, and is contradictory in its theoretical nature to any known substance. There is no reason for conceiving ether to exist (as described) only as a necessity in an undulatory theory of light.

Many have been misled into accepting unquestioned current theories of sound and light, because of the wonderful discoveries due to measurements and knowledge of facts relating to sound and light, but it must be distinctly understood that these discoveries are not *due* to these theories. Eclipses were predicted and verified *before* there was any scientific theory of light.

Ptolemy computed eclipses while supposing the sun to revolve around the earth. Newton believed in the corpuscular theory of light. Theories or no theories, mathematical and mechanical knowledge advances. This advance no doubt would be expedited by a correct conception of the relation of the causes and effects of the phenomena,

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There is no question but what the undulatory theory of light accounts for a larger number of the phenomena of light, and is more consistent in its explanation than the corpuscular theory. But that it does not account for all the facts in connection with the phenomena, and is therefore not absolutely the correct theory, scientists should not hesitate to admit.

The idea of inertia in matter may be discarded, but there is still an inertia of mind, which causes it to decline to revise its theories and creeds. Of course this trait is an essential one in nature in order that some fixity of type may be maintained, but between the inertia of Materialism and the erraticness of Idealism there must be a mean which is the shortest way to truth and knowledge.

When delicate means of measurement showed there was no accretion of mass under continuous absorption of light, the corpuscular theory of light was weakened. When variation in the assumed wave-lengths seemed to account for color, the undulatory theory of light became established, and no matter for how much it may *fail* to account, it will remain the accepted theory until some theory more nearly accords with all the known phenomena of light.

In giving a different theory of light, I am impelled to do so, not so much to explain this special phenomenon as to bring this as one of all phenomena under my general conception of the relation of Force to Power in my conception of Being.

If Force is manifest only through the varied motion of Power, and Power is only known through its atomic structure, and the motion of these atoms may by analogy be conceived as rotating and revolving or both, with varying degrees of speed, then I must

conceive light as being one of the variations of one or more of these motions.

Referring again to the illustration of the tops. Suppose we have a top spinning on a plate; the lessened friction at the point will allow it to revolve with the shape of the plate as the path of its orbit. If we touch the top, it will take an additional orbital motion. This complex motion might be called an eccentricity of the orbit, and in tops of a different specific gravity, with an equal speed of rotation and revolution, or with the same composition and different speed, this eccentricity would vary. If the orbit and speed of the revolution should remain the same, this eccentricity would be at the expense of a slight loss in the speed of rotation, or a slight acquisition of Force might be utilized equivalent to the eccentricity. It would take much less energy to give the top this variation in orbit than it would to vary the size or general shape of the orbit (*i. e.*, from round to oval, etc.). In the top this would be on account of friction, but in atomic motion pressure would be an equivalent impediment to an enlarged orbit.

To be consistent with my idea of the development of the senses, it must show that sight is impressed by a slighter variation of motion than hearing. But first we must define what the sense of sight is. The sense of sight is that sense which is impressed by some motion or variation of motion, and is transferred and interpreted to consciousness as the phenomenon of light, *i. e.*, luminosity.

Shape, distance, etc., are conceptions only formulated by co-ordinate experience in conjunction with the other senses. Light or luminosity is a variation of motion so slight as to be absolutely immeasurable by

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anything except the sense of sight. Generally that which we perceive as light is accompanied by other motions, which we call heat and actinic rays, both of which are measurable. The heat ray mechanically and the actinic ray chemically.

Tyndall, in one of his experiments, estimated that of a measurable amount of heat in a non-luminous ray, which was not in any way sensible to the eye, though focused directly therein, less than one thirty-thousand-millionth part of that heat energy, if it could have been converted into light motion, would have been sensible as luminosity.

From a ray from a given source, assuming waves of varying lengths, meaning of varying refrangibility, we would get a spectrum. If that spectrum showed at one end calorific rays, in the middle luminous rays, and at the other end actinic rays, then the wave theory would seem plausible. But when we find the calorific and actinic rays not only meeting in the centre, but lapping, and we are able to wipe off from the spectrum all the luminous rays without measurably affecting the calorific or actinic rays, it is palpable that a simple difference in the *wave-length* could not account for this difference in the phenomena. Now, I claim that in the ordinary ray, so called (or rather in the interception of the ray), there is an actual transfer of force, which is measurable as heat and mechanical energy. This phenomenon I will take up later, but in luminosity there is no transfer of force other than that necessary to cause a variation of the motion of the adjacent atoms in a like manner, which is sensible, but so slight as to be measurable in no other way, *i. e.*, is not in sufficient amount to cause a manifestation in a different and measurable manner.

It is commonly stated that light is white, but may be divided into primitive colors, but this is a misleading statement. No light can be divided that is not previously combined. In other words, no light from a single elemental cause is white. Various kinds of atoms have characteristic variations in their motions, and each variation is classed as a certain color. A combination of certain of these colors in definite proportions gives what we perceive as white light. A solid body coming into incandescence passes through several of the variations, which we perceive from red to violet, and then, as all these motions are combined by the organs of sight, we perceive it as white.

There is quite a difference in the perception of the ear and eye. The ear can separate the sound variations, and in a melody of sounds each may be perceived as a different variation, but this is not because the ear is a more delicate and discriminating organ, it is because the variation of sound motion is of so much greater lateral diameter and of much less frequency than that of light. The eye has a far more delicate perception. The ear could not locate sound to within probably a possible five or ten degrees of error, but the eye could locate light to within a very minute fraction of one degree of error. The eye can also perceive slight variations in color quicker than the ear can perceive slight variations in pitch.

Before going farther I will try to give a more definite idea as to the conception of the primary movements of the atom. The proportion of Force to Power might exist and be indefinitely increased: First, in the speed of the rotation of the atoms, which would be absolutely immeasurable and insensible (latent); second, in the revolution of the atoms, which would be measurable,

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relatively by the diameter of the orbit (density); third, in the variation in the shape of the orbit, round, elliptical, etc., which might be perceived as a variation to the senses, but not measurable (possibly the characteristic difference in taste and odor); fourth, in rate of the revolution, which would be measurable relatively only by results (elasticity); fifth, there may be an eccentricity in the orbit, *i. e.*, path of the orbit which may be perceptible as a variation but not measurable (luminosity). In the transmission of sound there is a difference in velocity according to the medium and conditions of the medium, dependent on density and elasticity. Density being equal, the variation in elasticity is simply the difference in rate of revolution. Again this relation may be perceived when the Force is used to increase the size of the orbit, and we call the material an absorber; or when the Force goes to increase the speed of the atom in its revolution, and we call the material a conductor.

I have said there seemed to be no necessity for assuming that there is any difference in the size of the atoms. Assuming an equal amount of attraction in each atom, or the atom as the smallest division and a definite amount of Power, every condition of the material is conceivable as a variation of the proportion of Force related to each atom. So far, we have been regarding the atoms as not having a proportion of Force sufficient to prevent their being within the range of the attraction of each other, so there might be manifest that which we perceive as material. While we acknowledge that the attractive power of the atoms does not vary, yet we know that the effect of this attractive power, *i. e.*, weight and density, does vary. A ball of a mass equal to one pound weight might be

revolving around the earth at such a velocity (resistance not considered) as to have no weight, *i. e.*, would not fall to the earth. We might say that to increase the mass of the ball would give it weight and it would fall to the earth. This, of course, would follow unless we at the same time increased the velocity in the correct proportion to keep up the revolution, and if this were done the result would be the same condition as before. This same law must hold good regarding the atomic attraction, which we term cohesion.

In the gases there is less cohesion than in liquid or solid, but there is some cohesion or there would be no variation in pressure. The velocity of an atom of hydrogen at one mile from the earth would more than offset gravitation, but it never is so great as to more than offset cohesion, and this connecting link of cohesion enables gravitation to increase the density and cause the pressure to be greater at one foot from the earth than at one mile. Suppose the velocity of the revolution of these atmospheric atoms increased many times the present velocity, the cohesion would certainly be less, therefore, the pressure would be less, and its weight less. Sound would then be transferred through it with greater proportionate velocity, but with less intensity. If the effect on the sense was equivalent, the impression could be made from a greater distance with an equal amount of energy, or, to put it another way, the sense might be affected with a less expenditure of energy. Such is the case with sight.

We will assume that there is an atmosphere in which the atoms are moving in their orbits with an intense velocity as compared with the velocity of such atoms as constitute the air, in fact nearly eight hundred

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thousand times such velocity. Such being the case, other things being equal, instead of an impulse being transferred from atom to atom at the rate of nearly a quarter of a mile a second, it would be transferred at the rate of nearly two hundred thousand miles a second. There would be no difference in the process, nor any difference in the medium, excepting the proportion of Force to Power would be about eight hundred thousand times that of the ordinary atmosphere. If one of these atoms were disturbed in its orbits by the addition or excretion of Force or the intrusion of another atom in its orbit, four changes could occur. The rotation might increase or decrease in rapidity; the rate of revolution might increase or decrease; the size of the orbit might increase or decrease; the path of the orbit might become more or less eccentric. The increase in rapidity of rotation might be transferred as actinic force, the increase of speed in the revolution might be transferred as calorific force. The increase in the size of the orbit might be transferred as electric force, and the various eccentricities of the orbit might be transferred as color or luminosity.

A checked rotation would give a sharper rebound, like rays of the greatest refrangibility, as the actinic rays; a checked revolution would give a rebound of greater angle, like rays of less refrangibility, as the calorific rays; and the larger orbit would give rays of still greater refrangibility, like the electric rays. The eccentricity of the orbit might give in its transfer any variety between the first and second, according to the eccentricity as color and luminous rays.

A statement of the reason for assuming that ether is atomic, or rather that there is no such thing as ether, but that space is filled with atoms, which I term "light

atoms," may legitimately be demanded. Even if such a theory is consistent with no more facts than is the ethereal or undulatory theory, it ought to be accepted, for by this theory no artificial, unreasonable, and illogical substance is assumed.

Two reasons might be immediately brought up to contradict this atomic theory. First, such atoms would cause resistance to the passage of the celestial bodies. Leaving aside hardness and tenacity, attributes which I have not yet explained and which do not enter into the equation here, resistance is in some way proportionate to density, but not directly proportionate. In decreasing the density, the resistance decreases much more rapidly than the density. Taking the computed density of lead as 1, water as .12, and air as .0009, we can readily see that a projectile moving with a velocity sufficient to penetrate lead one foot (not puncture a lead plate one foot thick, but to enter one foot in a solid block of lead where there could be no expansion of the material within the duration of the penetration of the projectile) would go much more than nine thousand feet with no other resistance than that of the air. On the assumption that density is caused by cohesion (density may of course be caused by pressure, but pressure could not have such an influence in a universal medium that could not be restrained) the density of the light medium might be little or much as the cohesion would be limited by the velocity of its atoms. On the assumption that light atoms move at the rate given we might fix the resulting density of the light medium at .000,000,007. To have increasing resistance there must be compression. The scientists assume that the ether may be compressed as is necessary to obtain the condensation and rarefaction essential to the wave theory.

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I assume that a body of these atoms cannot be compressed (except as I shall hereafter describe), first, not by another moving body, because they are mobile, *i. e.*, have a quicker motion than any other body of atoms. Second, not by enclosure, because from lack of cohesion, as explained, and rapidity of motion they penetrate all material, *i. e.*, pass between the molecules and the atoms of all cohesive bodies.

I have said the ether offered little resistance to any body of atoms, or material movements. I mean at the velocity usual to such bodies. To a body moving with slight velocity, mercury, on account of the mobility of its atoms, does not offer as much resistance to penetration as lead does, but to a body moving at sufficient velocity it would be fully as impenetrable as the lead. With a body moving at a velocity of a few miles a second, the ratio of motion is so little that no resistance of the ether is measurable. But as the velocity approaches that of the velocity of the atomic motion of the ether, the resistance is so great that it is supposed no motion could be of a greater velocity than light.

The second reason to be brought against this theory would be the effect of the mass on gravitation. This law of gravitation is generally supposed to be very definite, and all data derived therefrom to be accurate and absolute. I wish to state again that the phenomena that can be verified, such as an eclipse, etc., do not depend for their prediction upon a knowledge of this law, or of gravitation, or upon any other theory. Space and time are two items of an equation that we know with mathematical precision; volume and velocity specifically represent them, and from these bases practically all the absolute knowledge is derived.

Newton's first attempt at the verification of his idea

of a law of gravitation failed because of an incorrect assumption of the volume of the earth (the correct diameter was not known). This law is, other things being equal, bodies attract each other according to the product of their masses and inversely according to the square of the distance. Very seldom do you see this first clause quoted, but "other things being equal" is a necessity in an application of the law. Our only measure of attraction as gravitation is "weight." We know that weight varies, therefore we may compute the distance by this variation of weight in a known mass, but always we must know where all other things are equal. As an experiment let us have balanced on the arms of the scales two bodies; let us raise a vessel of water so as to immerse one of the bodies, and they will no longer balance, which seems to show that one weighs more than the other. We see by this that one of the things that must be equal is the medium in which the attracting bodies exist. As they mutually represent the attracting power of the earth we can immerse them both in water and, volume and density being equal, we find that they again balance; therefore knowing the weight of one we say the weight of the other is the same, and we know that the attractive power has not changed. But we will suppose the second body does not balance our known weight in this medium, as it did in the other medium. We know then that the volume being equal the specific gravity differs. Now, the only difference which could arise from the assumption of "mass" in the ether would be a change in the computed specific gravity of the bodies of the solar system. There could be no difference in the attraction, as it would be the same in all directions from all bodies. Assuming "mass" in the ether necessitates a certain amount of

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resistance proportionate to the velocity of the moving body. In assuming resistance it must be shown that a mistake has been made in computing the weight, or specific gravity, of the bodies of the solar system.

We will take for our illustration the moon in its orbit around the earth. Knowing the rate of falling bodies and the velocity of the revolution of the moon, we know there must be a definite proportionate weight existing between the moon and the earth. This has been figured to the satisfaction of the scientists with no allowance being made for any resistance in the medium in which these bodies swing. If there is resistance, then these bodies must be heavier, *i. e.*, have more mass than computed. That such is the case I will try to show. As I said in the beginning, if a school child can point out an error in a proposition of Newton's, he is of equal authority on the point at issue. I will point out one error which will be evident when seen.

Newton, in his seventy-fifth proposition, says that a body at the surface of the earth is attracted by the earth the same as if the whole attracting force issued from one single corpuscle placed in the centre of the sphere. This appearing plausible, he goes on in substance as follows: assuming that the radius of the earth is four thousand miles and using this as our first unit of measurement, according to the law that the weight of a body will decrease inversely as the square of the distance, a body weighing one hundred pounds at the surface of the earth will weigh twenty-five pounds at a distance of four thousand miles above the surface. The error in this assumption can be better shown by a concrete illustration. Let us suspend a spring scale, that will indicate one hundred pounds, to measure the weight of our body; and suspend from this a ring (of

neuter weight) to represent the body. We know that weight is the measure of the attractive power we term gravitation. Now we will attach to this ring three spring scales to represent and measure the attractive power. We will pull straight down on the central one of the three scales until it indicates eighty pounds. The attraction being eighty pounds, our weight measuring scales also indicate eighty pounds.¹ Now let the two side scales be pulled so each is indicating a pulling or attractive power of ten pounds. We will have these pulling down at an angle of forty-five degrees from the perpendicular, so as to represent the pull of the earth to its circumference on each side. The aggregate of our three scales now shows an attractive power of one hundred pounds. (Although the ratio may not be exact, this is certainly the way bodies at the surface of the earth are attracted, the larger portion directly down, and a lessening portion angling even up to ninety degrees when it is naught. If I were in any degree as able a mathematician as Newton, I would be able to give exactly the correct proportion, but for the illustration it does not matter. Any one can readily see that it is representative of the way any body is attracted by the earth.) As our scales showing eighty plus ten plus ten aggregate an attractive power of one hundred pounds, we might expect our weight scales to show a weight of one hundred pounds. While we *might* expect it, no one who gives it a moment's thought will expect it. The weight scale will indicate nearer ninety pounds than one hundred pounds (that is, when attraction is one hundred weight is only ninety). Let us swing the

¹ The fact that it would require more energy to effect a like change in two pairs of spring scales than it would in one pair does not in any way affect the pertinency of the illustration.

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two outside scales down the same as the eighty pound scales; then our weight will show the aggregate attractive force of one hundred pounds; that is, changing the assumed pull to the centre increases the weight. Let us swing the outside scales out and the weight scales will show a decrease until we reach within ninety degrees (which is the horizontal) and our weight scale will then show only eighty pounds. I can hardly imagine any one of intelligence denying the result of this experiment or illustration, so I will go on to the application. You will note, by referring again to the seventy-fifth proposition, that Newton said that a body at the surface is *attracted* by the earth the same as if the whole *attractive* force issued from the centre. I do not dispute this. He might just as truthfully have said that a body is attracted by the earth just the same when it is four thousand miles above its surface. The attraction does not vary a particle, but you will notice that not a word was said in that proposition about weight. Had he said the weight of a body at the surface of the earth would remain the same if the whole attracting force issued from one single corpuscle placed at the centre of the sphere, any one would have seen the error. Our illustration with the scales shows that the attractive power remaining the same, when we transfer it from its natural pull to an assumed pull to the centre, we increase the weight. But in Newton's demonstration, no allowance is made for this. Now all reckoning on weight is made from conditions as they exist, and the pound or other measure is defined as a specific mass, taken at a fixed altitude, in a specific medium, at a definite temperature, etc. When Newton or any other scientist says: "One hundred pounds at the surface of the earth," he means actual weight as defined, and not

a mass that *would* weigh one hundred pounds if the pull was all toward the centre, and, therefore, when Newton says that a body weighing one hundred pounds at the surface of the earth will decrease to twenty-five pounds at an elevation of four thousand miles, he is in error, for his proposition that attraction is the same, involves the assumption that weight is the same, which it evidently is not, and, therefore, the result at which he arrives, *i. e.*, that the gravity of the earth is one one-thirty-sixth-hundredths as strong at the moon's orbit as at the earth's surface, is not accurate.

It is true that the result of the error grows less as the distance causes the angles of side attraction to grow less, but I claim that scientists have no right to say that my theory, which permits of a resisting universal medium, is contrary to facts, until they shall give mathematical demonstrations that are free from any erroneous assumptions.

Let us compare the theory of the revolving atoms with the theory of the undulatory ether, and see which is more plausible. We know light travels or is transmitted in a straight line, *i. e.*, moves on one plane. By the theory of a passive medium there is no plausible reason for this phenomenon. To make this mechanically plausible, cohesion would have to be assumed as an attribute of the ether, but as no one can conceive attraction without matter, cohesion has not yet been given as one of the attributes of ether. It is simply asserted as a fact that light travels only on one plane without making any attempt to describe why it does. Now, by the theory of swiftly revolving atoms, it is easy to conceive that only those atoms might be affected by an impulse, whose plane of the orbits were perpendicular to the impulse, and those at an angle would not respond.

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Again it is known that light has different velocities in different mediums. How is this accounted for? They say that the ether penetrates all substance, that it is impossible to make a vacuum in which no ether will enter, that between every atom and molecule there is a certain amount of ether. In short, that ether is homogeneous substance, and we have the atoms swinging in this medium more or less numerous in any given volume. Now, what should hinder the passage of light through this medium? To be definite there seem but two answers.

First, we might say that the light in passing *through* these material atoms is more or less delayed, but it has not been assumed that the ether penetrates the atom, and to assume that the light passes through the atom without any other medium than the atom would be to discard the undulatory theory.

Second, we might say that the light took a longer time in passing *around* the atoms, but that is not consistent with the idea of light travelling in a straight line.

The way this subject is usually treated is to say that the velocity of light passing through different substances varies according to the density, elasticity, and molecular structure of the substance. But without defining the terms used, this does not make it mechanically clear why light does or does not pass through any substance. We can readily admit by the atomic revolutionary theory that the revolution of the atoms would be more or less effected in the orbit, and size of the orbit by the influence of the motions of other atoms. The consistency of this point will be more fully brought out in connection with phenomena that will be described later on.

Again, we know that light is reflected and refracted. How is this explained by the wave theory? I wish to again emphasize the point that the wave theory is founded on the analogy of the waves on the surface of water, and we are constantly referred to that illustration for comparison. (In justice I repeat that some physicists are honest and logical enough to say that in the phenomena of sound and light there is really nothing like a "wave" in the medium, that word being used merely as a convenience of expression). We are cautioned to remember that the particles of the waves make, in the forward and backward or up and down movement, but a small fraction of the actual length of the wave (scientists are usually correct to a minute fraction, but I have never seen, yet, where one has given the definite fraction representing the ratio of this motion), and that the *wave* is the essential thing in this theory. Now we know that waves on the water are deflected, interfere, etc., but I must again repeat that *wave-length* is only a *result* of the amplitude, and the relation of *length* and amplitude is as absolutely fixed as the swing of the pendulum by its weight and the length of its cord. The amplitude is the direct *cause* and the length of the waves is the *result* with a fixed relation. But in sound and light there is not only no *fixed* relation, but no *apparent relation whatever*. The length of the water waves has nothing whatever to do with the angles of its rebound, only as a direct result of its amplitude, as its relation is fixed. Again, I repeat, in the water waves the amplitude is the essential part, while length is a natural result. In the wave theory of sound and light they make all phenomena hinge on *wave-length*, but I have never yet seen a sensible, mechanical explanation of how a wave-

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length can account for a definite angle of refraction. In the atomic revolution theory it is quite apparent that the reflection, deflection, and refraction might be a simple result (I do not mean easily computed, but simple in its conception, if conceived as mechanical), arising from the varied movements of rotation and revolution of the interfering atoms, and the varied motions of the atoms composing the substance which they strike, or through which they pass. ("They" refer to the varied forms of motion by which Force is manifest and not to the individual atoms.)

In this connection, I might speak of the computed velocity of light. Roemer's computation from the movement of the satellites of Jupiter, gives 186,000 miles a second as the velocity of light. This has been verified by Hertz's computation with the aid of a mechanical apparatus by which light is passed through a slot and, reflected back from a distant mirror, passing through another slot when the machine is gauged correctly. This gives the same velocity, 186,000 miles a second. In the first instance only a minute fraction of the light passes through our atmosphere, and in the second instance it passes wholly through the atmosphere. Now where is the difference in velocity upon a change of medium that is necessary in the explanation of refraction? Possibly this necessity was not thought of, and a little fixing was done to make the figures agree.

In an article in a prominent magazine,¹ a professor in one of our largest universities said, in speaking of the cheating by psychic mediums, that they ought not to be censured too harshly, for scientists were not above doing a little of that, when for the good of the cause it

¹ William James, *American Magazine*, vol. 68, page 582.

was necessary to make things come out according to prediction. Theologians are frequently charged with twisting texts and making verbal quibbles in the effort to sustain their particular dogmas. Are scientists on a moral plane so much higher that their statements are absolutely reliable while others are subject to doubt? I suspect that some are prone to value their pet theories more highly than they do the truth.

But to return again to our subject of light. The various rays are classed as light, actinic, calorific, and electric, and the difference in their character is wholly owing, it is said, to the difference in wave-length, but I have yet to see the first reasonable explanation of how a variation in the wave-length can make any difference in effect. But even granting that the effect would vary as the length of the wave, that does not satisfy us how different effects come from the *same* wave-length. Let us take in the spectrum of sunlight a certain band in the blue. We see it is luminous, our thermopile shows heat and our nitrate of silver shows a chemical change. Here we have *one wave-length*, and three various and different effects. Why, if thermal, luminous, and chemical effects are due to a difference in wave-length, are all three effects derived from one wave-length? There is no explanation of this phenomenon by the wave theory. I have already given an explanation of this by the atomic theory. Theoretically, even *one atom* could give all three effects, the eccentricity of the orbit would give blue; the change in velocity of the revolution of the atom in relation to the size of the orbit of the revolution would give that specific amount of heat; and the checking of its rotation would give the intensity of force essential to a chemical change. As I have said before I do not mean to infer

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that these actions are as mechanical as the language suggests, but that the conception is plausible and can be expressed in language that makes the perception seem mechanically reasonable. Scientists assert that the length is the only difference in waves. I would be pleased to hear any one give an explanation that is mechanically reasonable of how a wave of ether of a specified length (and the scientists will tell you to a millionth part of an inch just how long that wave is) can produce so different effects, and confine themselves to the length as a differentiating cause.

Wave-length in the undulatory theory is a parallel term or an adaptation of the term "periodicity" or "frequency" in the vibratory theory. I will consider it from this point. In the chapter on "Force" I gave an illustration showing that iron was a quick absorber of heat and copper a quick conductor. The frequency of a change in size of orbits could be greater in iron and the frequency in change in speed of revolution could be greater in the copper. This thermal difference in the change designates a conductor or absorber. In either of these cases the period of maximum frequency would be comparatively long. In a vibration where change of motion could be more frequent we might have sound. The ability of a body to respond to such frequency would be designated as resonance. The atoms of a resonant body must then have a motion that can in some way synchronize with the transmitting medium. Let us take, now, a substance of greater mobility, for instance, incandescent sodium. In this condition the atoms of sodium are in such a state of motion that they can synchronize with the motion of the atoms of the ether (light atoms). The equilibrium is such that the variation of the ratio of Force to Power is of such

great frequency as to be sensible as luminosity. This variation of ratio may be from one atom to another and also a constant reaction with the atoms of the ether. This Force cannot be radiated into the ether, that is, be absorbed by the ether, but it can be transmitted by the ether. This point will be brought out more definitely in the chapter on "Radiation."

I wish to refer again to the phenomenon known as interference. I will give this extract from Tyndall¹:

Thus it is possible by adding the sound of one fork to that of another to abolish the sound of both.

We have here a phenomenon which, above all others, characterizes wave motion. It was this phenomenon manifested in optics that led to the undulatory theory of sound, the most cogent proof of that theory being based upon the fact that, by adding light to light, we may produce darkness, just as we can produce silence by adding sound to sound.

Did not most authors use practically this same language we might call it a lie, for no lie could be more misleading to one who did not know the facts. If I say that by putting a mirror in a beam of light I thereby create darkness, you know the language is not correct. While it is dark where before it was light, we know that the beam of light is simply deflected or reflected to some other place.

Now this is exactly what is done in all cases of interference of light or sound. Where there is a synchronism of motion in crossing rays, the revolving atoms of one ray interfere with those of the other and cause a slight *deflection* (not in the least degree an annihilation) and in the case of sound we have what is called "beats"

¹ *Sound*, page 381.

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and in the case of light there is a division into "bands." Wherever there is a dark band, the adjacent light bands are to an equal degree intensified, so there is absolutely as much light as there was before. This result (which is the true one) instead of being cogent proof of the wave theory is most cogent proof against it.

CHAPTER XIV

MAGNETISM

MMAGNETISM and electricity are not, according to my conception, extremely complex phenomena, but I find it extremely difficult to explain them satisfactorily because the assumption upon which this explanation is based brings in relations which, if existing, have not been recognized. The advanced scientists have boldly repudiated the idea of an incomprehensible luminiferous ether because it failed satisfactorily to account for so many of the phenomena, and in its place substitute the assumption of a medium which can be electro-magnetic in its action. The essential weakness in many scientific hypotheses is in endeavoring to make one phenomenon the cause or explanation of another phenomenon, whereas the real relation is that of different manifestations of a common cause.

According to my conception of Being there is no essential part that can be separated, analyzed, and definitely described. All essential parts of Being are inseparably associated; in fact, the microcosm is representative of the macrocosm; certain of the forms manifest phenomena in a contradictory manner, and my explanation must necessarily cover these extreme relations.

Before proceeding to relate various phenomena accord-

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ing to my conception, I will refer to the electron theory so widely discussed. Regarding the electron theory of electricity it is frankly stated that "the new theory does not pretend to give a reason for the cause of electric phenomena. There still remains a mystery. . . . The electron theory is much more a theory of *matter* than a theory of *electricity*, or rather, in the new system, electricity is set up in the place of matter, the existence of which was, on the whole, not much better understood than is the essence of electrons at the present time." Briefly stated, the electron theory starts with supposing that these electrons combine to make atoms. An atom with one electron more or less than normal becomes an ion. This electron theory is supposed to account for attraction, and therefore explains matter. Attraction is explained by stating that atoms are unstable, that is, having one more or less electron than normal, they become positive or negative ions, and unequal atoms, *i. e.*, ions, are attracted in order to equalize. If we admit this, it only accounts for the "why" of attraction, and not for the "how." Even crediting this theory with all that it claims, it does not explain the cause of the *power* of attraction or the *force* of electricity, or the existence of ether or any other medium of transmission, nor of the transmission. Why, then, is it so frequently stated that this theory upsets all the old ideas of matter? The orthodox conception of matter is, that it is indestructible and that its mass is unchangeable. It has been demonstrated (to the satisfaction of some scientists) that the mass of the electrons is not stable, that is, that the mass of a given number and volume of electrons may change. When we remember how the scientists have computed the infinitesimal smallness of the atoms, and we are now told

that the electron is to an atom as a dust mote is to a church in size, we must have great respect for the physicist and mathematician who work with electrons as glibly as a mechanic does with a two-foot rule. Their work is both creditable and credible. It is all beyond my ability, but not beyond my admiration. But I have no more respect for their *assumptions* and *theories* based on the discovered facts than I have for my own ideas.

Computation of the mass of the electrons is based on the heat which is developed by the particles themselves when they strike an obstacle. The velocity being known and the heat being estimated, the mass can be computed. By different methods, different physicists have demonstrated the ratio of mass and velocity of moving electrons by an agreement relatively closer than two mechanics would agree on the length of a given board, and in each case they assumed that the only source of energy is the mass and observed velocity.

Suppose we drop two balls of equivalent mass equal distances through a vacuum; the velocity of each would be the same and the energy developed we suppose would be equal. But, suppose we have one of the balls rotating with intense speed; the velocity and mass of each are equal, but the energy developed by each is not the same. Now, if we have the velocity, and energy (*i. e.*, heat) developed by each, ignoring the rotational velocity, we would erroneously compute the mass of one as being *greater* than the other.

Again, suppose we have a given mass of water passing through a nozzle at a given velocity and striking an obstacle; we get the development of a specific amount of energy. Let us now presume an equivalent mass of liquid oxygen and hydrogen, mixed in proper propor-

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tion to represent water, passing through a nozzle at a velocity equal to the above, theoretically we would get a development of heat, *i. e.*, energy, just equal to that in the previous illustration. But practically, we would not find the experiment in agreement with the theory. We might get a serious explosion, but otherwise we would not get the development of much heat. If the physicist could not investigate this experiment with any more data than is obtainable regarding electrons, he would certainly demonstrate mathematically that the atoms of the liquid last ejected had much less *mass* than the first. Now, we immediately think that we could notice the difference in the surrounding air. Granted; but if the air were practically incompressible and uncontrollable, we could not know that it had weight, mass, or pressure, and there could be in it no such measure as temperature. This is practically the condition of the ether, and when its electrons are demonstrated to have varying mass, there is no way yet of telling but what their motion (not lateral velocity) under the conditions just given is abnormally small, and under those conditions it would be analogically parallel to liquid air, and the heat developed would not be at all in proportion to the real mass and velocity. The absorption of force under those conditions would not be perceptible. It seems a more simple solution of the condition to assume a variation in the latent energy (which I have stated elsewhere is conceivable as a change of motion) than to repudiate one of the basic ideas of science, "the immutability of matter."

I wish to draw attention to another point, which, if true would invalidate the conclusion of a necessary change in mass. We know that the velocity of falling bodies is not proportionate to the mass of these bodies,

except as the surfaces of such bodies meet with resistance in the medium through which they fall. In air this resistance is calculated and allowance is made. No allowance is made for the resistance of the ether, for at the ordinary velocity of moving bodies no resistance has ever been detected. It is only when the velocity becomes so great as to approach the velocity of the light atoms that measurable resistance occurs. Resistance of the air accounts for a variation of velocity and a change of energy developed by falling bodies. If this resistance was not known or even suspected, then every variation of developed energy, velocity and volume being known, must be supposed to be from a change of mass, and unless and until *mass was declared stable* it would be impossible to detect and demonstrate resistance of the air. On the supposition that mass is unchangeable, the resistance of air has been demonstrated and defined. On the experiments of comparatively slow-moving bodies it had become an accepted idea that the ether was not a resisting medium. On the assumption that the ether is not a resisting medium when the electrons with a known velocity develop varying degrees of energy, the physicists claim that this is a sufficient demonstration that mass varies. I claim that it is impossible to demonstrate that mass varies until it is conclusively proved that there is no resistance of the light atoms (ether) and if there is resistance, to prove there is no variation of resistance, or else to know the exact variation that may exist.

The prime object of any theory in science is to make the physical phenomena mechanically comprehensible. Scientists, or, in fact, any one, who can realize the difference between comprehend and conceive, cannot comprehend how an apple can fall to the ground, or,

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in other words, there is no acceptable theory of attraction or of how Power or Force can act through space. The advocates of the electron theory claim that by this theory attraction is made comprehensible.

I will give but two instances to show that the difficulty of comprehending is only shifted back one degree. They say if we can tell how one atom is attracted to another, then it would be simple to tell how the moon is attracted to the earth without material connection. Then we are given the idea that one atom of hydrogen is one electron short, and another atom has an electron too many, and on account of the difference they are attracted to each other and an exchange is made. That is apparently simple, but according to the computed *relative* distances between an electron of a negative atom, or ion, and a positive atom, or ion, it is sometimes greater than the distance from the earth to the moon. If we cannot comprehend how the earth can attract the moon, how can we comprehend that a negative ion can attract a positive ion because it has an electron it wants, though the space separating them is *relatively* greater than the distance separating the earth from the moon?

As a second instance, I will give two extracts from an authoritative work, describing certain phenomena of the Crookes tubes, where the existence of electrons is demonstrated¹:

In the first case the phenomena is explained by an attraction exerted on the ions by the objects near which they pass. In the second case, the two conductors attract and hold the ions which carry a charge opposite in sign to their own and so remove them from the gas.

These electrons move with accelerated motion and rapidly acquire a velocity sufficient to make them capable of

¹ Augusto Righi, *Modern Theories of Physical Phenomena*, page 42.

ionizing by impact the gas molecule, at some distance from the cathode. . . . The electric force drives the positive ions created in this manner toward the cathode.*

It will be noted that attraction as a *power*, and electricity as a *force*, are given as *causes* of results in the very experiments meant to show the existence of the *electrons* as a cause. Then, in the second quotation it will need considerable explaining to show how electrons expelled from the positive pole, or anode (with no suggestion in the theory that there is any attraction in the negative pole, or cathode), can move with an "accelerated motion," and by what means it can "acquire a velocity." Nowhere in the theory is it maintained that electrons can spontaneously generate electric force. Of course, assuming that a thing can spontaneously move with "accelerated motion," and "acquire a velocity," then the impact and driving which follow as a result are comprehensible. The point of the criticism is, that by this or by any other theory the attempts to explain Power or Force as phenomena simply remove the *impossible* one stage, like making the elephant rest on the back of the turtle.

I called these electrons "light atoms" and assumed their existence before electrons were demonstrated to exist or were given a name, but I did not and do not now assume that they are any different from any other atom. It is frequently assumed that the qualities of matter are in the atom, that the hydrogen atom is the lightest, etc. Given two equal number of atoms, and if one lot were revolving in an orbit twice the radius of the other lot, we, being without the means of knowing this, might assume that, taking equal volumes, each

* Page 50.

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atom in the one lot was four times as large as each atom in the other lot. We would naturally assume the size of the orbit to be the size of the atom. We know absolutely nothing about the atom, even assuming the atom to exist. We know something of the material as it is manifested, and, assuming that it is atomic in its structure, we presume certain things of the atoms. The oldest idea of the solid, inert atom which is comprehensible, taken by itself, is being, or in reality, has been abandoned by most authorities because it is not only incomprehensible when taken in connection with physical phenomena but is not in accordance with demonstrated facts. The chemical nomenclature and symbols prevent the practical abandonment of the idea of atoms of varying weight. We say that two atoms of hydrogen combine with one atom of oxygen, making one molecule of water, and that each atom of oxygen weighs sixteen times as much as each atom of hydrogen. As a matter of fact, no one knows whether, in a molecule of water, there is one atom of hydrogen and a thousand atoms of oxygen, rather than one atom of oxygen and a thousand atoms of hydrogen. There is absolutely nothing known of the absolute or relative size and mass of any single atom (the ultimately indivisible). This statement may seem startling, but it is true. Now, where nothing is *known*, I have as much right to *conceive* and *assume* as has any one else. I prefer to assume that an equivalent number of atoms are of equal mass; that the apparent difference in volume and weight arises wholly from the difference in the size of their orbits; and that this difference, as well as the velocity of rotation and revolution, arises wholly from the varying ratio of the Force to Power, which combined, cause the various physical phenomena.

I wish, by an illustration, to show that two different phenomena (cathode rays and light rays) may be due to a simple difference in the *motion* instead of a difference in the *medium*. It can be demonstrated that the cathode ray (or some portion of it at least) is corpuscular, and that the particles composing the ray are subject to attraction and repulsion, and therefore are material, while the ordinary electric, actinic, and light rays are not subjected to attraction and repulsion and, it is assumed, must therefore be *ethereous*, *i. e.*, not material. Then again, these light rays have ten times the velocity of the maximum velocity of the electrons, so this is taken as additional proof that the rays of light are not propagated by a material medium. We will take for our illustration in this analogy Tyndall's row of elastic balls to which we have already referred. "Urge one ball to the row, and the ball at the opposite end will be repulsed." Assuming elasticity to be perfect and friction nil, the amount of energy developed by the last ball will be just the same as though the first ball had gone unobstructed to the end where the energy was delivered, but there would be one perceptible difference. It would take much longer to deliver the energy, if the first ball went to the end, than if the energy passed through the row of balls. Our energy has been delivered in less time but, taking conditions as a whole, there has been no net gain. The value of the time gained is just what it would cost in time to place the first ball in the position formerly held by the last ball.

As a variation of this illustration, suppose we have two tubes one being empty and one practically filled with elastic balls in contact. Let a ball be projected into each tube with equal energy, and at the opposite

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end we get the delivery of a ball with the same amount of energy, but in one case in less time than in the other. Suppose, now, that we knew nothing of conditions excepting the projection of a certain amount of energy at one end and the reception of energy at the other end, we would then say that in one case the velocity in the ray of energy is much greater because it has travelled from end to end in less time. And would it not be very natural to say that the reason must be because there is less material obstruction in one tube than in the other? And would it not be rather surprising to find that the tube which gave the greatest velocity was the tube that was nearly filled with elastic balls? If these balls were in synchronous oscillation, the effect would be the same as if they were in contact, excepting a slight variation in time (as a practical illustration, this latter would be impossible, as gravitation would immediately destroy the synchronism, but friction, gravitation, imperfect elasticity, or any *mechanical* exceptions do not enter into the *atomic* motion).

Let us vary the illustration again and assume the balls to be on a smooth table and without the restraint of the tubes, and subject to the influence of a repulsive wind or some form of attraction. The ball that traversed the whole length would be deviated from its path by the repulsion or attraction and the energy would be delivered at a point out of a straight line; but the *string of balls* would deliver the energy true in a straight line without deviation.

Now, the point I wish to make by these illustrations is, that a transfer of energy is no less material in one case than in the other. In one case the energy was carried from one end to the other in the identical volume of material; in the other case, the energy, or its equiv-

alent in force, was transferred from one specific volume of material to another specific volume of material; and that in spite of the greatly increased volume of material implicated and the numerous transfers of energy, or force, it was finally transferred and delivered in less time than if it had been carried the whole distance in the original specific volume of material. This is the logical result, because it requires more time to change through space a specific amount of material than a specific amount of Force related to that material. This is, to me, one proof that Power, of which material is the manifestation, is of greater relative value than Force, although Force in union with Power is essential in causing the matter to be manifest.

Taking these illustrations as an analogy, we may assume that, with light atoms or electrons, with a period of revolution or oscillation eight hundred thousand times that of the atoms composing the ordinary atmosphere, the transfer of force as light could be atomic just as conceivably as the transfer of force as sound is conceived as atomic; and from this analogy, when we see the electrons given off from the cathode giving a certain effect in a certain time by a corpuscular transfer of energy, and we see a like effect in less time where there is no transfer of the corpuscle, *i. e.*, electron, I have a right to assume that there were more of these corpuscles engaged in the work, and that the force was transferred from one to the other in less time than when the specific electron traversed the distance. I have no idea what law would apply in computing the time, but if the rate of revolution of one atom is eight hundred thousand times greater than another of equivalent orbit, then the ratio of Force to Power must be greater, certainly eight hundred thousand times as

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great, and under certain conditions of relations of Force and Power, the greater the ratio of Force the greater the conductivity of Force. I say, under certain conditions of relation, because there might be a million times as much relative Force and Power in certain material, and if it were latent as rotation, its stability as such might cause the material to show no elasticity excepting under certain conditions. If the size of the orbit of the electrons were smaller in the ether than in other material the rate of revolution would have to be proportionately greater than that given.

Seeing nothing in the realm of scientific fact to conflict with the assumption that space is filled with atoms revolving with such a speed as to prevent the usual conditions which permit the manifestation of attraction, as cohesion, I will make this assumption as part of my conception of Being.

I have frequently referred to the constitution of matter as not being so simple as formerly supposed. I have no conception of what matter would be like were it the result only of the materialization of the Power of attraction. To say that the universe would be an inert mass were there nothing but attraction, is as superfluous as predicting what would happen if the moon were green cheese.

It is conceivable that all the Power in the Universe might be concentrated in an infinitely small space and that it might be rotating with such a velocity as to represent all the Force in the Universe. This conception would be no more absurd than many Idealistic conceptions of the Absolute. But now, if we were to assume a *revolution*, then there must of necessity be occupied a definite amount of space. And if we assume the Power to have parts and each part revolving, then

the space occupied would be proportional to the number of the parts and the size of their orbits. It is rather difficult to conceive of attraction directly increasing or decreasing the size of the orbits of the revolving atoms, but by assuming a contrary Force the conception becomes simple and intelligent. While thus relating Power and Force as entities makes the *conception simple*, it is not in reference to specific phenomenon as *comprehensible* as the Materialistic or Dualistic conception.

It is tacitly, if not authoritatively, recognized by physicists that there is an "expansive force." I conceive that every atom of Power has associated with it a certain (not specific) amount of Force. How the association exists or how the relation is maintained I have not the faintest conception. As an analogy, I refer to it as the atoms being in motion, and the variety of motion, rotating, revolving, etc., with varying velocities as representing the ratio of Force to Power. I conceive the atoms to be different only on account of the difference in the normal ratio of Force to Power and the way the relation is maintained. I conceive the motion of the atoms of the molecules to be as intricate and yet as orderly as the motion of the members of our Solar System, and I have no doubt that the velocities and distances are relatively as great. What we perceive as material is the forms the matter assumes under the joint action of Power and Force. These forms I conceive as developing according to the "Supreme Desire," limited only by the conflict of the individual desires. Scientists now realize that it is not only the organic forms that manifest intelligence in their construction, but that any particle of material will show to the physicist and to the chemist wonderful

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forms and shapes and a perfect co-ordination of parts. This proof of intelligent design is satisfactory to many, and I, in my conception of Being, assume it to exist and term its result the "Manifestation of the Desire."

When I speak of the *form* in which matter is manifest, I do not mean alone the shape and condition of the perceivable material, but the relation of one part to the other like, for instance, our Solar System. On our Earth, the varying ratio of Power to Force causes solid, liquid, and gaseous states in which the stability varies. In its equilibrium, at least, the liquid is less stable than the solid, and the gaseous form still less stable, that is, both as to its atoms and mass, the gas has a greater latitude of movement. I conceive the atmosphere which fills space (ether) as being still less stable, that is, not only the atoms but the mass is also in a state of relatively extreme motion. But there is one vast difference between the ether and the air; the pressure of the air is according to its volume, that is, if there were more air, other conditions being equal, the pressure would be greater. In the universal medium, *i. e.*, ether, the pressure is an unknown quantity. It might be infinitely great or infinitely small. I conceive it to be great, but not infinitely great, at least relatively not so great but what certain conditions may cause in portions of it a change of density. (We may take mercury as an illustration to show that density does not bear a fixed relation to mobility.) When we compress air, we restrict the size of the orbit of the revolution of its atoms, and the force thereby represented is discreted, being absorbed by the adjacent material, and as the orbits of revolution of the atoms of this adjacent material increase in size, or as the material expands, we say it is heated. Now, when we

compress or change the condition of any body or particle of material, the light atoms (electrons) confined therein are restrained in their orbits, and the force thus represented is expelled to the other electrons, or atoms. As the Earth is surrounded by the air, so is each specific body of material permeated and surrounded by its atmosphere of light atoms more or less dense or in greater or less degree of motion according to the material composition of the body.

Material is commonly supposed to be a heterogeneous conglomerate of atoms and molecules, possibly with some sort of motion but nothing very definite or exact. There is no apparent relation in the movements of all the various bodies of the universe. The comparatively modern discoveries give us the knowledge that a few of the bodies are related in their movements, and these, we say, compose our Solar System. This is not enough to give any idea as to a plan of movement of the other great bodies of the universe. But the knowledge that there is a definite and very exact relation between the bodies of the Solar System causes most physicists to have the idea that all the bodies of the universe have movements in some way related to each other.

Now, I believe that every particle of stone, ice, or wood or anything in which there is an organic cohesive connection is built up with an exactness and definiteness, and for intelligent reasons, producing forms that surpass the mechanical ability and knowledge of man. I believe the action of every atom to be spontaneous and conscious. While the primary movement of the atoms may be in response to its Desire, yet the result of its action is not necessarily comprehensible to the atom itself. In fact, the ultimate result of the action

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may be practically different from the result aimed at, as all things are subject to conditions. I will illustrate my meaning in this way; when conditions are such that the molecules of water get close enough so there can be organic action of the atoms, they proceed to build up a beautiful structure which we call a crystal. This crystal may be mechanically perfect in its structure but its special form is not mechanically necessary. If it were, each crystal formed under the same conditions would be absolutely like all others. While there is a family likeness in crystals of each definite substance, there is very great personal difference. I believe that each crystal is formed by a conscious response of the atoms to the impulse or Desire to perform a certain action. Now, this does not necessarily mean that any one of the atoms comprehends the shape of the crystal, its composition, or use; but even granting that they did realize and appreciate the building of which they are a part, the building may be quickly crushed or only imperfectly formed, and ice instead of snow is the result. Thus we see that conditions may control the resulting action of the primary Desire. But even in the ice there is still evidence of an organization under the conditions imposed, and there are cells and lines of cleavage, etc. There are characteristics even in ice.

Materialists claim that this is all done from mechanical necessity. The Dualists claim that it is mechanically done by the direction of an exterior Power. I claim that it is a spontaneous action of the parts, and that our idea of mechanical necessity comes from our experience and observation of the manifestations of these parts.

An atom of the earth bears a natural relation to each of the other atoms of the earth. The conscious Desire

of an atom bears a natural relation to the conscious Desire of the Ego, but during the ages there has been organized a machine (human brain) which demonstrates to the Ego a certain *comprehensiveness* of the limitations of time and space, which is probably not given to the less-favored atoms. These limitations exist. The individual Desires are of small avail against conditions and are practically powerless at any specific time except through co-operation or organization. Varied conditions arise or exist from the conflict of individual Desires or their concerted efforts, to construct or maintain various forms.

Any of the heterogeneous conglomerate manifestations that may exist apparently in the material are the result of conditions. Conditions change; the Desire is persistent. I was saying that each particle of material was, in a way, permeated and surrounded by an atmosphere of light atoms and that their relative motion was affected according to the composition of the material. In most cases the particles of material are of such a conflicting character as to neutralize any noticeable effect, but in many cases the material is of such a character that the effect is quite apparent. Any specific kind of atom under certain specific conditions of temperature, as gas under a definite pressure, will have a motion giving a very definite result (osmosis). The movement of these same atoms as a solid may be as definite, according to its condition, but its movements under such conditions are not so easily determined because difficult or impossible to demonstrate. But, when a specific mass of atoms without apparent change produces different results, we are forced to conclude that it is from some motion of the atoms or some peculiar, unseen change in the molecular

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structure which these movements build. When a steel bar is magnetized, there is no apparent difference in its structure, and yet its relation to its atmosphere is changed. The demonstration of this peculiar atmosphere, termed the "magnetic field," has brought it within the realm of fact. Of what this atmosphere consists, and the cause of its various motions is still theoretic. I assume that this atmosphere (ether) is composed of light atoms revolving with great velocity. The motions of this medium show a large ratio of velocity to density, or as I would term it, Force to Power. An extreme velocity would give the atmosphere the quality of rigidity. This atmosphere permeates dense bodies and is influenced to some degree by them, or rather according to the synchronism of the vibration, there is a closer relation and a greater possibility of an interchange of their force. Ice, water, and vapor show great changes in form simply by having an increased ratio of Force to Power. Changes of no greater difference than this may occur in the universal medium, and be what we call electricity, magnetism, and other ethereous conditions. Of late years this idea is beginning to be recognized by physicists, but the chief thing against its admission is that the idea cannot be made mechanically comprehensible.

As I have stated, I conceive ether to be atoms with an intense velocity of motion. The portions of this which is in or near other substances may act and be acted upon by these substances so that the velocity is changed, that is, that the ratio of Force to Power is changed. Thus, some of the atoms may have less motion than normal, and some may have more. (What I mean by normal is not very definite. The normal motion of a hydrogen atom would vary according to conditions.

We would not say that the normal condition was in water any more than in ice or vapor or in acid. But if some atoms existed as ice and some as vapor in a room whose temperature was forty degrees, we would say *that* condition was abnormal, and as fast as force could be obtained, the ice would melt, and as fast as force could be radiated, the vapor would condense. Under those conditions, the movement of the atoms in the ice would be abnormally small and in the vapor abnormally large. These changes, which are always spontaneous, from the abnormal to the normal, is what we recognize and term transformations of energy.)

With the physicists the idea seems to persist that motion means expended energy and work done; that all motions must be ultimately down-hill. But I believe that down-hill is no more applicable universally than is the old idea that people on the other side of the earth are hanging with their heads downward. I believe that for every down-hill motion there is an up-hill motion. What we perceive as motion or energy is a change in the material form, and the change we desire as work done is, relative to us, generally of an up-hill nature. Therefore, the energy we use in accomplishing this is the down-hill movement.

In a spinning top, we say the energy represented is proportionate to the mass and velocity. If the motion were in a straight line or in an orbit, it would be just the same. If there were no friction, this motion would persist; would continue forever as such a motion. But we see at the point of the top some friction. The energy is changed, and a greater motion is seen to arise in the material at the point of contact. The mass of the top is practically unchanged, but its motion is changed, that is, the velocity of the motion is less.

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Therefore, as the energy is proportionate to the mass and velocity, there is now less energy represented by the top, and an equal amount of energy is present in the other material. I have said that the rotating and revolving tops might by analogy represent the atoms, but it is only by analogy. How Power and Force, or Mass and Motion can be associated is incomprehensible. Two atoms are never in contact; their associated Forces may be in contact, but when we speak of the contact of an immaterial Force, it carries no meaning whatever. Scientists may say that it is unthinkable how force can act at a distance, *but I say that it is unthinkable how Force can act at all.* Vortexes, corpuscular bombardment, electric stress, magnetic flux, and all such efforts to make Power and Force and their primary movements mechanically comprehensible, seem but to add distance to the absolutely *incomprehensible* First Cause. I digress so frequently to enforce this point because material philosophers seem to insist that there is no essential part of any phenomenon but which may be made comprehensible. Almost every new discovery in science is heralded as, if not the last, almost the last step in the solution of any mystery there is in Being. When I premise the existence of Power and Force as the sole composition of the universe, I make no pretence to a comprehension of Power and Force nor of the manner of their relation. When I premise that the Desire of the Power governs this relation, I make no pretence of comprehending how it is done. I do conceive, in my conception of Being, a ratio of Force to Power, and that in the various parts of the Being this ratio varies, and by analogy I get a *conception* of the general working of specific parts of Being.

Scientists generally speak of *matter* and *energy* as

though they were the two different parts. So far as we perceive the material, there is none but what shows the joint manifestation of Power and Force, and this is necessarily so, as we can only perceive the material on account of a transformation of energy, *i. e.*, change of relation of Power to Force in one part of the material to a change of relation of Power and Force in another part of the material. We are sensible of nothing but a change in the form of energy, and furthermore, as I have stated before, the specific part of the changing energy perceptible (sensible) to us, is *absolutely immeasurable* in any other way. It is this incontrovertible fact that has given the Idealists such justifiable ground for many vague conceptions of Being. I do not try to weaken my idea that two and two are four, because some Idealist says that two and two may be five, in the next world. So, I accept our sensible experience of facts as of prime importance in my conception of Being, and try to make that conception as comprehensible of the whole as possible, without believing that it will be or could be entirely so.

I often use the terms "matter" and "energy" (atomic motion), but in no sense is it to be construed as an intermediate or secondary cause. I speak of Power as being manifest as matter, and Force as being manifest as motion, but matter is never separable from motion, therefore, Power is never manifest only as material in which form it is perceptible through peculiarities of motion. The difference between the amount of motion of the atoms of the material in one condition and the amount of motion of the same mass of material in another condition we term energy. Physicists grant that "matter" is an abstraction and that material only is concrete.

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With this long "interamble," I will go back to the point where I said that ether may act and be acted upon by other matter. We will take a magnet for instance: we will suppose the movements of the atoms and the condition of the molecules composing the magnet to be such that the ether may be compressed, *i. e.*, become more dense. We recognize that density may come from three causes; first, from cohesion, as lead, where the ratio of Force to Power is relatively small (apparently); second, from spontaneous and inherent change of the kind of motion, as nitrogen in nitrates, where the ratio of Force to Power may remain relatively high; third, from gravity or mechanical pressure, as the lower strata of air, where the ratio of Power to Force is proportionate to the pressure. The greater density of the ether which exists in the magnet, or in the magnetic field, whichever place we may believe it is more dense, is somewhat different in cause and effect. In the above three instances the movements seem to be normal and stable so long as the conditions are stable, that is, there is no sign of interatomic contest—no perceptible strain. The variation of density assumed in the magnet gives rise to phenomena more like air or water unequally heated. Take a vessel of water and apply heat to the one portion, and we get up a current in the water. This comes from the unequal density under the equal pressure. In this experiment we have energy (kinetic). In the magnet and the magnetic field, we have a circulation which must be an effort to relieve the stress due to an unequal density under equal pressure. But in this instance, there is no energy (kinetic), rather the energy is so continuously equalized as to be imperceptible.

What is a magnet? Pumping water attracts no

attention, but suppose a person had never before seen such a similar operation. The first impression would naturally be that the machine manufactured the water. If it was explained that the water was in the ground, then the idea would occur that the plunger in the pump must have some sort of attraction or affinity for the water, and thus lift it. Some learned person might say that it was the pressure of the air which forced the water up to the plunger; a real scientist might advance his knowledge by informing him that it was really the power of gravitation which pulled the air down and gave it the pressure which enabled it to force the water up. The person might then think that he was ready to graduate in physics, but I would not be satisfied to let him go until I had said that there really was some attraction of the plunger for the water, as without cohesion there would be no suction which is necessary to cause a vacuum; that, also, the force of the air essential to a change of pressure with a change of density is just as essential as the power of gravitation which causes the density.

The moral of this story follows: A dynamo is a complex magnet. There are people who think a dynamo is a machine to manufacture electricity—some people even believe this who know that a pump does not manufacture the water. But most people think they know that the electricity already exists, and that the magnetic part is really what attracts the electricity, and that the rest of the dynamo is what pumps it out through the wires. Some learned person will say that it is really the pressure of the ether on the magnet, which is a vacuum, and the momentum of the entering ether which forces some of the electricity out at the valves, where it is caught up by the revolving field and,

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by centrifugal force, thrown through the brushes on to the wires. Then, some scientist will say that what causes this pressure is really electrical attraction; that certain of the electrons are absent in the atoms, which are, therefore, ions having a negative charge; and that certain ones have a positive charge, and that they are unequally distributed around the magnet, and the efforts to get together cause the disturbance. Of course, these are but parodies on the theories, but it is sufficient to say that the knowledge of what electricity is, or its cause, is theoretic, and that the theories do not agree.¹ "The impossibility of finding a satisfactory *mechanical* representative of the supposed electric deformation of the ether made it soon apparent that even under the new order of idea, the conception of the nature of electricity still remained obscure." In the last few years a number of facts have been demonstrated which have eliminated many theories and given rise to many more, but, to my knowledge, nothing has occurred to change my original conception.

In rewriting my book, I decided to use the term "electron" more frequently than "light atom" because that word now conveys some more definite meaning. Of course, what electrons are, is no more known than what atoms are. I do not suppose that there is any difference, except as to their motion.

I must make a few more digressions before I am ready to give my answer as to what a magnet is. If we take a strip of steel and fasten one end, we can set the steel into vibration. We say that the duration of the vibration, other things being equal, will be in proportion to its elasticity. But what is elasticity? Before answering this point I must go back still farther. What is

¹ Righi, *Modern Theories of Physical Phenomena*, page 12.

steel? The relation of Power to Force, in its simplest form in the elementary gases and liquids, may be relatively simple, because there is comparatively no complexity in the forms. But, let this relation, in a minute drop of water change, and we have a snowflake. I have an idea that the movement of every atom in that flake bears an accurate relation to the movement of every other atom; that the cohesion and expansion essential to its parts are expressible by an absolute law. All these might be computed mathematically, explained mechanically, and expressed algebraically, at the expense of pages of figures, words, and signs. And then we could not *comprehend how* or *why* the snowflake was formed. Now, in this simplest of forms, with a minute change of the ratio of Force to Power, what a difference in the material. Compress enough of the flakes together to give us a body, as ice, and we have the quality of hardness, which was not possessed by the water. From this, I draw the conclusion that hardness is a result of the "form" which is brought about by the relation of Force to Power in this condition. Hardness is not an attribute of matter, but of certain forms which some matter takes. It seems easier, or more natural, for some classes of matter to take on this form, or, as I express it, the Desire of some atoms causes them to take the form characteristic of iron, which is comparatively hard; and it is more desirable for some other atoms to take the form characteristic of lead. And if the Desire of these atoms is unchangeable, it is certainly admissible to say that atoms of iron or lead are elemental. We say that certain atoms are apt to take certain characteristic forms; but the attribute is of the *form* of the materials and not of the atoms.

Coming back, now, to the steel rod, we conceive the

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difference between this rod and a stream of molten metal is one more of form than a simple variation in the ratio of Force to Power, as we perceive in a liquid more or less hot. The difference in combination and the various processes of manipulation offer conditions for formations that, no doubt, are at least as accurately proportioned and as artistically fashioned as if planned by a human architect. Steel, then, is a material with a characteristic form of motion.

I wish to make the point of difference between "form" and "shape." Shape is the spacial aspect observed by us; by form, I mean the peculiarity of motion. The shape of the formation may be changed, as snow is changed to ice by mechanical pressure, but there still persists a form of motion which gives the ice its character. So, in the steel, the crystals of the iron may be mechanically changed or modified, and the form of the motion give different results, but it is the *form* of the material as well as the matter in the material that gives it character. The shape of the material has practically no bearing on "form."

If we bend down one end of the steel rod, then release it, we see it spring back. We say it is elastic. Conceding elasticity as the attribute of form, we might, from the foregoing, define elasticity as "the ability of the material to regain its characteristic form." In the case of gas, there is no definite shape, but there is a form. When the pressure is removed from a gas which has been compressed, it immediately expands to its original form (volume). If under the compression, a portion of the Force of the gas is taken away, it can expand only as it can regain the Force from the surrounding material. Because gas has this power to take this necessary expansive Force from the surrounding

material and regain its normal form, we say that gases are perfectly elastic. Now, hydrogen is not perfectly elastic, but the *gas*, hydrogen, is perfectly elastic. Or to put it in another way, hydrogen in the *form* of a gas, is perfectly elastic. So, iron in the *form* of steel is elastic.

The text-book says that, "elasticity is a strain in the material, and the cohesion of the convex side and the expansive force compressed on the concave side doubly aid the *relieving* of the stress." I will admit that "strain" and "stress" are words expressing the same phenomena, and that elasticity is the antonym. But let us look a little closer at these given causes.

1. On the convex side the atoms are drawn apart. Now, when atoms are drawn apart, according to the law of gravitation (which cannot be proved not to apply), the cohesive effect would be *less*.

2. On the concave side, the expansive force is not compressed but pressed out, which is shown by the adjacent material expanding, *i. e.*, becoming heated, and therefore there is in this side of the material, *less* expansive force than formerly.

These explanations contradict both the causes given for elasticity. I may be rash in contradicting the cause for elasticity as given in any text-book on physics, but I will try logically to maintain my position. Cohesion as a form of attraction can directly have but one result, which is, in increasing the density of the material, *i. e.*, contracting the material to the least resisting volume. (So far as tenacity is used to express cohesion, it is not directly a form of attraction, but indirectly a characteristic of the form.) Take, for instance, air, which may be compressed to the form of a liquid, supposing the Force (heat) to be abstracted during this process of compression (this supposition is necessary to illustrate,

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as air *may* be compressed to a density greater than liquid air and yet not be in the form of a liquid), and if in a proper receptacle, we may see a gas remaining for a definite time in a liquid form, yet it is in reality a gas and not a liquid. It is perfectly elastic, that is, it is able to regain its *characteristic* or normal *form* if it can get the force necessary to that formation. Some presume that the ability lies in the Force and that the mass is inert. I conceive the ability to be in the mass, or that Power has the control and Desire dictates to Force so far as conditions permit. I have said before that, so far as we might judge by energy, Force seemed to predominate, but I have seen one man control tremendous forces and direct more energy than was required to create the man himself. It is not necessarily this absolute ratio of Force to Power that indicates the controller.

I claim that Attraction is the Supreme Power, and that the Desire of this Power manifests itself as material through the aid of (or by directing the opposition) Force; that this Power is atomic in its structure (*i. e.*, that each particle of Power is a specific part of that Power and can be no more or no less), but that according to the Desires of these parts, they may, as conditions permit, maintain a greater or less proportionate amount of Force; that these atoms (on account of consciousness, memory, and volition) are able to co-operate and take form, each form having its characteristic; that the conflict of these Desires causes a transfer of Force from one to the other; that this Force, as transferred from one to the other, is what we call energy, and which is the sole method by which we, as human beings, have our consciousness impressed with the perception that there is any such thing as Being.

Now, after this recapitulation, we will come back to elasticity. Saying that elasticity is the *ability* of a material to regain its characteristic form, does not explain this ability. A man may mechanically describe a steam engine, but he cannot mechanically explain how it can run without ultimately using some word, such as Power or Force, which cannot be mechanically explained. The property of elasticity can be described, and its relation to the other properties can be demonstrated, but the effort to give a mechanical explanation of elasticity is, I believe, futile. This same statement holds good with any other of the characteristics of a material. Hardness, tenacity, ductility, etc., can be described, and, given sufficient data, any one of them could be predicated, but I do not believe the ultimate cause of these attributes in the form of the material can be expressed any more definitely than is expressed by saying, it is "a Manifestation of the Desire of the Power." It is true that it is expressed more concisely by saying that it is "a law of nature" or the "will of God," and I would use either of these expressions, but they would not convey to most people my conception. (I do not know that the language which I use will even do that.)

I have dwelt on the attribute of elasticity rather more than on any other because this is apparently the most important characteristic in all ordinary forms of energy.

When we bent the steel rod, we used a certain amount of energy. We now have in the rod a strain or stress, which means that the material is out of its normal form, and, as an elastic body, it has the ability to regain this normal form, providing conditions will allow it to

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do so. This is very different to saying "when conditions compel it to do so." If it were an iron rod, the energy used in bending it would be manifest as heat in the rod, or in the material surrounding the rod. In the steel rod, the heat, *i. e.*, force, expelled from the concave side is, to an equal quantity, absorbed by the convex side. So, the energy is manifested in the strain, or rather, because of its failure to manifest, we say the energy is potential in the stress. This is a current scientific phrase, but "energy potential in the stress" no more explains why the material will, if permitted, takes its characteristic form than the phrase "because it has the ability." This latter phrase is more apt to convey the idea that the steel is part of an Intelligent Being than the other phrase, even if it does not convey as much meaning to a scientific mind.

I think we are now ready to come back toward the magnet. (I say "toward" but not to it yet.) We will say that the steel rod is formed by *atoms* which *have a characteristic motion*; that it is permeated by the ether whose *atoms have a characteristic motion*. Some scientists say the ether permeates all atoms. I do not believe it. I conceive of atoms occupying a definite space, and that the volume as well as mass of each atom is unchangeable.¹ But I conceive that a large number of atoms may revolve through the same space, and if the size of the orbit gives the impression of the

¹ This of course is a mechanical and material conception that is not assumed as a literal fact. But if we do not have this conception we are compelled to give to the abstraction of space a mystery and admit that *two* bodies *may* occupy the same space at the same time. The moment we assume Spirit as occupying space we make it *material* and I must of necessity do this to make my conception sensible.

The *conception* of Being may be comprehensible even though the *relations* conceived are not comprehensible.

size of the atom, then, to an equal extent, would we get the impression that one atom could absorb another, or that one atom could penetrate another. (As it is said that the electrons pass through the atoms of solid material.) But, under any arrangement of the revolution of the atoms to economize space, there would be a limit to the number of atoms that could exist in a definite space. Now, if some of the atoms have an elliptical orbit (and I believe that most revolving bodies have), under any systematic form, when two materials, as the steel and ether occupy the same space (no two atoms occupying the same space at the same time), it is natural to suppose that the orbits would coincide; that one or the other must curtail its orbit, or the two together occupy more space. Now, I claim this is the condition of the magnet. There is a contest between the steel and the ether as to which shall maintain its characteristic form. As it takes time for an internal atom to reach unoccupied space, the orbit must be curtailed. To say that the orbit is curtailed is the same as saying that the proportion of Force is lessened. As we have seen in a former illustration, the force could be shifted to the outside space quicker than the atom itself could be. While the pressure of the ether may be enormous, it is conceivably not so great as the combined pressure occurring from the effort of the steel and ether, each endeavoring to maintain its normal form, which is equivalent to saying that the ether is more dense inside the steel, which would again be equivalent to saying that the proportion of Force is greater just outside the steel, as certainly the mass of ether in its effort to maintain its characteristic form could resist the efforts of the steel to compel an absorption of this surplus force. Under these conditions, we would have (supposing a

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continuous motion of the atoms in this essential way) a perfect continuously acting spring composed of two separable parts (the steel and ether), each of whose parts, Force and Power, are partially separable. The steel, a solid, occupying a definite location in space; the ether, a substance more mobile than gas, but the intense pressure and velocity of revolution of its atoms giving it a rigidity equal to the steel. Under these conditions is it difficult to conceive an effect that we know is manifest by a magnet? We see that there would be a continuous circulation of the ether. An increased density inside, and an increased force outside would give the same condition as would exist when water is heated in one part; in the heated part, more force, and in the colder part, greater density; and the more mobile the substance the greater would be the velocity of the circulation to relieve the strain. This conception of the magnet seems to fill the demonstrated conditions. We may call the density the negative electricity, and the increased force the positive electricity; or we may call the atoms that are deficient in force, "electrons," and the surplus force, "electric force." By this conception, which I believe accords with known facts, there is nothing unusual brought into the phenomena. Power and Force are the only constituents. Assuming these to exist with varying relation, admitting the ability of Power to control Force, and the conception is apparently logical. It may be asked, if Force is interchangeable and the same, why the surplus force cannot be utilized to expand the steel. I might say, because of the characteristic form of the motion of the atoms of the steel, which would be true. But I think it may be made even more comprehensible than that. Atoms, to exchange their force,

must be, to a degree, in synchronous vibration. We may, by analogy, illustrate it in this way: if upon a rotating grindstone water is ejected, the stone will carry the water through a partial rotation and reject it. On increasing the speed of the rotation we reach a speed when the water will not be carried around, but will be repelled immediately upon striking the stone. But, if the water is ejected upon the stone with a speed somewhere nearly equal to the velocity of the circumference of the stone, say thrown from another stone rotating with equal speed, then the water would be carried around, or partially around, as at first. The difference in velocity or synchronism, is part of the characteristic form. This peculiarity is seen when a third body is necessary in a chemical union, its presence being necessary solely as a transformer to synchronize the motions. This process is termed catalysis and the third or intermediate body is termed a catalyst.

To show that this conception of the magnet is logical, I will apply it further. I said that elasticity was the ability of the material to regain its characteristic form. We will take our strip of steel into an extremely low temperature; according to my conception, the orbits of the atoms will then become smaller, *i. e.*, the material will have contracted and the ratio of Force to Power is less. We bend out strip of steel, and before the end can move as far as it did in the higher temperature, it snaps in two; it is brittle. This is a logical consequence. The orbits of the atoms have lessened, but the arc through which we bend the end of the strip is not proportionately lessened. So, the atoms on the convex side are separated beyond the limit of cohesion, and the strip is sundered. The strip might still be elastic, but the arc through which it could be bent and still retain

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its ability to regain its characteristic form, would be lessened. We see, by this explanation, that cohesion and heat, *i. e.*, Power and Force, are both essential parts to elasticity. While under this condition, although the strip is less laterally elastic, it is still electrically elastic and remains a magnet, although not so powerful.

Now let us take it to the other extreme; the strip will retain a definite lateral elasticity through a much greater degree of high temperature, until finally the ratio of Force to Power is too great, and it will lose its elasticity. The character of the material changes with the changed form. It also ceases to be a magnet. Scientists say that, under heat, a magnet loses its electrical elasticity. I say that it does not and could easily prove it. By increasing the ratio of Force to Power, the atoms enlarge their orbits, the material expands. Now, two conditions have changed; there is more space occupied according to mass, and therefore, less pressure on the enclosed ether; and there is also more proportionate Force; therefore, the exact balance essential in an active spring is not present. It is not that the strip has lost its ability to regain its characteristic form, but that the conditions are not such that it is losing this form, and, of course, the elasticity is not expressed until the strain occurs. I will presently show how it can be made a magnet again under this same condition of temperature.

The circulation of the ether around the magnet, caused by the disturbance of its usual characteristic distribution of Force and Power, *i. e.*, density, is marked by "lines of force".¹ I have dwelt on the

¹ The term "force" in this phrase has a different meaning from the word Force I sometimes capitalize. Here it is used as at present

magnet at some length to illustrate a certain phenomenon, and explain this phenomenon as an equal contest of the steel and the ether, each to regain or maintain its characteristic form. Now, in reality, the ether in any material body, is continually being disturbed. If every body is permeated by the ether, then a change of pressure will, to a certain extent, change the form of the ether just as the magnet does, but, under ordinary circumstances, the equilibrium is quickly regained. If we put two different materials in contact under pressure, the electrons will be more numerous in one of the bodies, the force excessive in the other, and if carefully separated, will each carry the unequally divided ether (positive and negative charge). But, like two vessels of water, one hot and the other cold, if they can be connected, they will equalize. The connecting by "lines of force" only indicates a strain, and not a physical connection. The electrons cannot cross the span because they have not the force, and the force on the other side is not sufficient to overcome the pressure of the intervening ether. But suppose there were a path of less pressure, then, along this path the equilibrium would be established. Under certain conditions, copper is such a path. The molecular vibration of copper seems to synchronize with these

accepted by scientists as indicating a condition of strain or stress. Holding to such a definition of the term it would be as absurd to assume a "conservation of force" as it would be to assume the "indestructibility of the strain." But the term force has in the past been used to define a cause of energy and as such was claimed to be indestructible. The misunderstanding arising from the use of the term "force" to designate both a cause and an effect gave rise about a half-century ago to a very heated controversy among scientists. I would have been pleased, had it been possible, to have chosen terms to use in the place of Power and Force that conflicted less with other accepted definite forms of usage.

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electrons, or to be of such a nature as, under force, to attain quickly to such a synchronism. Under pressure the copper is enabled to contain more than its normal amount of force, and that would give a result exactly opposite the magnet. There would be a large portion of force inside, and, therefore, a relative density outside. This is the condition of a wire along which a current of electricity is passing. While the pressure is, no doubt, from the inside, it is the outside atoms which respond to the increased vibrations. We say the electrons are at one end, and the force, or pressure, at the other, but they exist in equal or normal proportions along the wire. When the connection is made, there is simply a strain set up along the length of the wire, all the force, *i. e.*, pressure, along the wire shifts toward the negative end, and all the electrons on the wire shift toward the positive, *i. e.*, opposite end.

If we take a coil of this wire over which a current is passing, we can predict that, within the coil, there is a region of excessive pressure with lines of force opposite to those in the magnet. When we heated the steel magnet, we found it ceased to be a magnet, and I said that the increased pressure within from the increased ratio of force, and the enlarged openings from the increased volume, made conditions so that there was no longer a conflict and, therefore, no chance to manifest elasticity. If we have a porous vessel full of water, by increasing the pressure on the water we find that it will ooze through the pores. By increasing the pressure on the outside of the vessel until it equals that on the water, the vessel will again retain the water as at first. Now, on heating our magnet, the pressure (internal) increased, and it also became porous (expanded), and the electrons leaked out. But, if we could increase

the *exterior* pressure, we might still retain the electrons. This we can do by surrounding it by the coil of wire through which a current of electricity is passing. Here we have the increased pressure, and we again have our active magnet, which shows that *increased temperature* did not destroy its *electrical elasticity*. It is even a *stronger magnet* than before. Why? Because its increased volume and the increased surrounding pressure enable it to hold more of the dense ether, *i. e.*, electrons.

Iron is similar in structure to heated steel, and becomes a magnet if inserted in a coil of electrified wire. If two unequally porous bodies are immersed in liquid under equal pressure, the one which is the more porous will, in equal time, absorb more liquid. This holds good of the iron as a magnet. The iron is as electrically elastic as the steel, but on account of its porosity, more pressure is needed to cause the density to be such that there may be a contest. When this condition is given, it is a stronger magnet than the steel would be, under like conditions of exposure. Just as soon as the pressure is relieved, the iron ceases to be a magnet. This condition is of great importance in the modern transformation of energy. This condition of receiving and relieving a strain is termed the magnetic flux. The movement of the electrons or the force essential to such a strain is termed the electric flux. The magnetic flux is a *mass or mechanical movement* of the ether; the electric flux is an *atomic movement* of the ether. These conditions necessarily accompany each other or are, as it were, reactions of one condition on the other.

Magnetism may exist as in a magnet, without mechanical movement or any sign of electricity. Electricity may exist as in a Leyden jar, without

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mechanical movement or any sign of magnetism. A mechanical movement may exist without being accompanied by either magnetism or electricity. But let any two of these co-exist in relation and the third is *invariably* present. Therefore, a "flux" indicates the coexistence of all three conditions.

I must mention here one other thing which is called a property of matter, viz., inertia. The general idea of inertness conveyed by the word "inertia," is so foreign to my conception of matter that I dislike to use it. The quality of a body remaining quiet until moved is called inertia, and the quality of a moving body continuing in motion until checked is also called inertia. It is frequently stated that it requires a certain amount of energy to overcome the "inertia" of a body, and as every one knows that it requires more energy to start a body than it does to keep it moving, this statement passes current as a scientific fact. Now, a body in motion has mass and velocity. Other things being equal, these two give what is called momentum. Before we start a body to moving it has no velocity; therefore, no momentum. After we start it, it has velocity; therefore, momentum. We may keep this body moving with this same velocity, and, as we are not *adding* to the momentum, we do not need an *additional* amount of energy. So, we say it requires *less* energy to move it after it is in motion. Our *extra* energy in the *beginning*, used to start the body into motion, was not used to overcome the *inertia* of the body, *for no such quality exists*, but to give the body *momentum*, which, when stationary, it did not have. I hope this explanation will make it clear as to my meaning of the word "inertia" when I have occasion to use it.

Every moving body must have momentum, whether the earth or an atom, but it is much easier to compute the momentum of the earth than it is to compute the momentum of the atom, providing we take the known data of each. It is true that we do not know the velocity of the Solar System through space, which would make our computed result regarding the earth questionable; but, of the atom, we do not know the speed of either its rotation or revolution. As a matter of fact, so long as the earth and the atom continue in their characteristic motion, it makes no material difference what that momentum may be. Momentum is manifest only when the moving body is checked, and it is as absolutely impossible for us to stop the motion of the atom as it is to stop the motion of the earth. Certain specific motions of a specific body of atoms or a specific portion of the earth, may be stopped, and it is with these portions we have to deal. Any lateral movement of a specific volume of anything has momentum. We easily recognize this in the case of solid bodies; with liquids, it is less noticeable, because of their mobility. But, under pressure, a liquid acquires a rigidity that makes its momentum practically useful, as at the hydraulic mines of the West we may see a small stream of water disintegrating the rock and tearing down the mountain. With air, it is still less noticeable, but, under sufficient pressure, such as is evident in cyclonic disturbances, we see heavy bodies moved, steel rails twisted, etc. With ether, it is difficult to get conditions that could show momentum, as its pressure is so great and so equalized as not to permit of a perceptible increase of pressure. But the impermanent magnet is such a condition. By our ability to create a magnet instantaneously, we change an equal

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pressure to an unequal pressure and this necessitated change in density means that a specific volume must move laterally and be checked, which gives the momentum as energy. In the permanent magnet, this momentum cannot be utilized because the inequality is in a constant or continuously equalizing state.

I have said that there was increased density inside and increased pressure outside; but the material motion of equalizing tends to pass the density more to one end, and, therefore, the pressure more to the other end. This is not distributed absolutely, but relatively. When within the influence of our magnet is brought another magnet, or even anything that may be magnetically influenced, there is a disturbance of the unstable equilibrium of force ratios and a chance for momentum to be demonstrated. With our magnetized iron, as before mentioned, we have a greater capacity, or more of the ethereous material is subject to change. We have relatively no greater momentum, but more of the surplus force can be captured and transferred.

It is useless to go into any description of the modern generators. It is sufficient to say that the force, electric force, we may call it, or electricity, is no different here from elsewhere. Conditions enable us to accumulate it and give it great pressure. We measure the current strength by the unit ampere; and the potential, by the unit volt; and the quantity passing in a second of time, by the unit coulomb; or in an hour, by the watt-hour; and we are enabled to do this because it has a fixed relation to the amount of work it can do.

Now, we must not consider this Force as being disassociated from Power. It is simply that the relation of Force to Power is greater and more abnormal here

than anywhere else, and that it will seek a position of less strain. We will try to regard the conducting wire which completes the circuit as a continuation of the magnet, under reverse conditions: the pressure on the interior, and the density on the exterior; the density coming from the negative end of the magnet, and the pressure from the positive end. As we bring the ends of the wire together, we have the circuit completed and the strain released. The density (electrons), coming from the negative (cathode), and the pressure coming from the positive (anode), unite, and the form is normal. I will try to be more definite in this. When I say that the density is on the inside, and toward one end of the magnet, and the pressure is on the outside and toward the other end, I do not mean that there is any marked line of division, like a bag of peas at one end and a pail of water at the other; and when I say the condition on the conducting wire is just the reverse, and the electrons travel from the one end and the pressure from the other to equalize, I do not mean that any specific electron travels over the wire. The condition already exists on the wire. Many have the idea that the electricity traverses the wires, similar to putting water into one end of a pipe and letting it come out at the other end. The process is more nearly like having a pipe full of water and using it as a piston cylinder. The water, being nearly incompressible, and elastic, could be used as a medium by which to transfer the pressure from one end to the other. If each end of the pipe be covered by an elastic diaphragm, not a drop of the water need be lost. The wire is composed of atoms with a form of motion such that there may be an intimate association and exchange of force; the strain is taken by the wire as a step; then, when the communication is estab-

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lished, the wire is barely a path. While there is a shifting of the electrons *toward* the positive end (which, in case the wire is cut, would be *from* the negative end), I have no doubt that, as force is transferred more quickly than power (that is, with less energy), the actual equalization is practically all brought about by the transfer of the surplus Force to the Power. I have purposely shifted from the use of one term to the other to try and hold the mind to my conception. Power, density, electron, negative—each refers to the same entity. Force, pressure, electric force, positive—are used to indicate their opposites.

One point more I wish to make here. This strain, or separation of the electrons from the electric force, or rather, this comparatively slight shifting of the relative amount of force, is simply a change back to and from the normal. The Power which, in this case, is the electrons, or light atoms, has the Desire which fixes the normal or characteristic motion. When this motion is limited or curtailed by the motion of the atoms of the magnet, it is much easier for the electrons with the deficient amount of force to regain this force from other sources than for the electrons with the excessive amount of force to get rid of this force, providing the conditions are the same. This is demonstrated by the greater permanence of the positive charge. It is also a logical result from the assumption that the *light atoms* (ether) *are the most stable of all atoms in their characteristic forms of motion*. They are only unstable in their equilibrium.

We have assumed that the ratio of Force to Power in the electrons was at least eight hundred thousand times that of Force to Power in the atoms of the atmosphere. That would mean that, if we could take the force from one electron and transfer it to the air, it

would double the force in a volume of air eight hundred thousand times as great; or, to put it in another way, if we could increase the pressure on a given volume of ether one eight-hundred-thousandth part of the normal, we could double the force in a like volume of air. This latter condition of change is more likely to be the one that exists to a greater or less extent in all bodies. As ether permeates all bodies, therefore, if friction or pressure occurs on or in that body, there is a strain established just in the ratio in which the ether is unable to escape from the pressure. As I have said before, I have no idea what proportion of the total amount of force of an atom is transferred when its motion is lessened. The amount that is transferred is all that we can measure. We can never know the absolute value of an atom until we catch one and make sure that its rotating and revolving motion is transferred, and that it is perfectly stationary relative to the universe. No one is liable to undertake this task. Even the absolute zero would give only the minimum sized orbit.

I must refer to the magnet again. Take a common horseshoe magnet, and we know there is in and around it a condition of stress. We place across the ends a steel or iron bar of suitable size, called the armature, and it is impossible for us to demonstrate that, as a whole, it is now different from any other ring of iron. No lines of force can be demonstrated to exist. It is not an active magnet. Let us, by mechanical energy, pull the armature away. The mechanical energy has now caused the force to be manifest, there is a strain and lines of force. It required mechanical energy to move the armature; we will say *moving the armature by mechanical energy* illustrates, in the simplest manner,

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our dynamo. Now, let the armature go free, and it moves to the magnet. It is not now moved by mechanical energy. Its movement is spontaneous; it is moved by Force. The armature is within the lines of force and its structural form gives a path of least resistance to the current of force in its effort to equalize the strain of its abnormal form of motion. Saying that the armature is attracted by the magnet does not describe the conditions. The magnet is an essential condition. The cause is the force which is unequally distributed in and around the magnet and uses the armature as a path of least resistance in its efforts to equalize and naturally makes it become the shortest path allowed by the condition. If we have a string run through hollow links loosely arranged in the shape of a square, a motion of the string will tend to draw in the corners and make the links take the shape of a circle. We could not say that this contraction is due to any attraction. So the contraction of the space between the magnet and its armature is not necessarily due to attraction. Without contending over the proper form of expression "The magnet attracts the armature" or "the armature is forced to the magnet," we must certainly admit that, whether it is Attraction or Force, it is *not mechanical energy* which causes the movement. In this spontaneous movement the cause of the motion is within itself and we may call it a mover or "motor." As the Force in and around the magnet and armature causes one or both to move, so the electric Force causes the motor to move and to mechanically move machinery.

We mechanically separate the armature from an active magnet; it is a dynamo. We allow the armature and magnet to spontaneously move together; it is a

motor. The dynamo is *moved* mechanically; the motor *moves* spontaneously.

This may seem a simple description of the wonders of an electrical system and the distinction between dynamo and motor, but I do not believe that pages of technicalities would elucidate any more clearly the primary difference between dynamo and motor, or the difference between the mechanical transfer of energy (by mechanism) and the transfer of mechanical energy (by Force).

CHAPTER XV

ELECTRICITY

LET us follow Force in its various relations to Power, and see if its transfer seems logical and consistent. We will start with one of the most familiar phenomenon—a fire. We have our coal surrounded by oxygen, but although we say there is a very strong affinity between the oxygen and the carbon, they do not unite. As I have said before, there must be a certain synchronism of motion before there can be a transfer of force. This is done by increasing the size of the orbit of the carbon, or as we say, heating it to the kindling point (the point where its motion synchronizes with that of the oxygen). This may be done by rubbing two pieces of coal together, but let us apply our friction to something that has a lower kindling point—the substance on the head of the match. This starts the match; the match starts the wood; the wood starts the coal. There is absolutely no *beginning* to a transfer of force; so we will have to jump into the circle and get a starting-point. We will start with the oxygen uniting with the coal (carbon). As I have said before, the oxygen in uniting with the carbon gives up some of its force. A portion of this force goes to heat the coal, that is, to increase the size of the orbits of its atoms. The surplus force is transferred in various ways, but we will follow only one. It

goes to increase the size of the orbits of the atoms of adjacent material; we will say it is the iron of a boiler. The force travels from one atom to another of the iron, increasing the size of the orbit of each, and we say this force is heat, and travelling by conduction. It is then transferred to the water and travels by convection; as the atoms increase the size of their orbits, we see that the water expands, and being enclosed, we measure this expansion by the pressure. If the temperature is great enough, some of the water takes the form of a gas or vapor—steam, we generally call it. The change from water to steam is not gradual but sudden. The increased force in the water has increased the size of the orbits of its atoms to some extent, but much of it has gone to increase the speed of the revolution. Finally this is inverted and is changed to increase the size of the orbit, and the expansion is greatly increased. By this expansion the pressure is greatly increased. We will now let some of the steam pass through a pipe. As an enlarged pipe, we called it a cylinder along which slides a movable partition called a piston head. The pressure of the steam, which really means the effort of the steam to gain its characteristic form as a gas (it is here too compressed to be normal), overcomes the resistance on the piston head, and the piston rod is moved. This movement of the piston rod is a mechanical movement. We are now moving a given mass of material through a given space at a given velocity; and, whether by cranks, shafts, belts, or pulleys, no matter what the complication of the machinery, it is mechanical. When we apply this mechanical transfer of energy to pulling the armature from a magnet and creating a strain, we are really changing again and going from the mechanical transfer of energy to the actual transfer of

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Force, which may be manifest through the strain or electric force, which is resisting the movement of the armature.

Before continuing we must consider at greater length one of the steps in the transfer. This step is one of the great changes that occur in nature, for which physicists can give us no reason. At a certain temperature (varying according to pressure) liquid will take the form of gas. There is no more force in the gas at that temperature, but its characteristic form as a gas requires more room; in other words, the speed of revolution is changed to size of orbit, and thereby the pressure is greatly increased. That this pressure could be utilized was the great discovery of Watt. When water changes to vapor (evaporates), it displaces a definite amount of material, requiring a specific amount of pressure to do so. This displacement is a mechanical movement. We did not use the expansion of the iron or the water, so, we did not take that into consideration; but now, there is a displacement of the piston head, and we have a mechanical movement, the immediate cause of which is Force. We do not have this movement (displacement of the piston head) in addition to the other (displacement of the air) but in place of the other. If the increased pressure could all be utilized in moving the piston head, there would be no steam at all; it would be recondensed to water. If it condensed at 212° , the piston head would return by air pressure to its first position. If it condensed at a lower temperature, there would be a gain by the piston head equal to the temperature lost. But this force must, of necessity, have gone to heat adjacent bodies. One other peculiar condition comes in here to aid this transfer. Under an equal amount of force (heat) gas expands to a much greater proportion

than a solid or a liquid. Therefore, in addition to the increased pressure coming from the change of a liquid to a gas, we have the increased expansion of the gas from the addition of heat. The best constructed engine can utilize only a portion of the force, that is, some steam will escape as gas, in which case it displaces the atmosphere instead of the piston head. I wish to emphasize the point that the release of Force from the oxygen results in the expansion of the adjacent material (as heat), and in case of the water, it increased the speed of the revolution of the atoms and could not be detected (the energy becomes latent); that when the form of the material of which it was a part changed, the change was on account of a change in the form of motion (from the speed of revolution to increased size of orbit); and that the derived pressure is exerted and manifested somewhere. Because we use some of it on the piston head and call it "work done," is no reason why we should say we have *changed* our Force into mechanical energy. We may transform energy, but we never transform Force. We may change its form of motion, and when that change is an increase in the size of the orbit it always is manifest in a measurable movement which is mechanical, and may be transferred as mechanical energy. As a physical basis of measuring mechanical energy, "the mechanical equivalent of heat," is all right, but, when from this one gets the conception that Force, as heat, is annihilated, and mechanical energy or movement of a mass of material takes its place, I believe that one has a wrong conception and one which hinders a correct conception; for, as one scientist says¹:

However attractive the hypotheses, they are ruthlessly

¹ Trowbridge, *What Is Electricity?*, page 3.

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abandoned as soon as the touchstone, the measurement of the heat equivalent of motion, is not satisfied by the hypothesis.

Water at 212° has more Force than its temperature would indicate. At the point of least resistance or pressure, some of the water changes its form of motion (With rare exceptions, no body of water contains enough force to change its whole body instantly into steam.) With the change in form, there is no change in temperature, that is no heat is manifest, but there has been an expansion equal to fifteen pounds of pressure. But this lifting of fifteen pounds to a height equal to the increased volume is not mechanically available, as that is only equal to the air pressure. If we have any pressure in addition to the air pressure, such as represented by our piston head, it will require more Force (heat). This is manifest first in increased temperature, but it does not require a doubling of the force, as temperature, to get fifteen pounds more pressure, for, as we said before, the expansion of gas under equal heat is greater than the expansion of liquid.

Now, under a temperature of 250° , we have lifted our piston head, representing fifteen pounds, a given distance. Could we create a vacuum back of it, the same pressure would lift it as far again. But we will take it in the position to which it has been moved, and it represents so much mechanical energy; we have moved a given mass of matter a given distance, but by so doing, we have lost no force. The steam under the piston head would, if released, from the pressure of the piston head, expand the fifteen pounds necessary to lift the atmosphere. It may be asked why we cannot put a catch under the piston head and let out the steam, which will then expand the atmosphere the same as if

it had not raised the piston head, thus having a net gain of the fifteen pounds of material elevated. It might also be asked why not create a vacuum, when the pressure would raise thirty pounds; then put the catch on, let the air pressure on above and the steam pressure out below, and have thirty pounds net gain. The only catch we have in this is the fact that nowhere in the transformation of energy can we stop our experiment and show a net gain. We know that to create the vacuum would necessitate a pressure of fifteen pounds, thus offsetting our last supposed gain. We ought also to know that the fifteen pounds in the first case represents the total pressure in excess of the air pressure, and the only way to relieve it is to exert an equal pressure in some other way. In other words, in relieving the pressure, we let our piston head drop where it was at first. I claim; that, when Force is changed from its latent or potential form, as speed of revolution or rotation, to its manifest or kinetic form, as increased size of orbit, the *pressure* resulting therefrom is mechanical energy; that an equivalent movement of material *always* occurs, whether it is imperceptible in the atmosphere, dispersed in the ocean, or concentrated on a piston head, there is no difference in the gross or net; that Force is never transformed into mechanical energy; that Force or heat is never measurably *manifest* except as *mechanical energy*. This assumption is of such importance to my conception that I will repeat an illustration to emphasize it. Reversing the experiment, let our piston head represent a certain amount of mechanical energy; we utilize this to compress the air in the cylinder. (It is generally said that the air is heated by compression. I say the orbits of the atoms are curtailed, and the force essential to such an orbit is,

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therefore, transferred to adjacent material.) To expand this air again under the pressure will require exactly the same amount of force (heat) as was transferred or radiated. But suppose we surround the cylinder with ice, and by mechanical means continue working the piston; we can gradually melt the ice. This is accepted as proof by some that heat (force) has been created by mechanical energy. I say, the air being perfectly elastic, that is, having the ability to regain its characteristic form, can get the force essential to its expansion under ordinary conditions, and that this force might pass through a solid mass of ice. But the surrounding conditions *might* be such that it could not get the force (heat), and then it *would not expand*. We know that this ability to get the force necessary to expansion will reduce the temperature of surrounding bodies, and it will even liquidize the air surrounding, but, at some point, it may fail to be able to extract heat, and, therefore, will fail to expand. Of course, I know that the scientist can bring out his algebraic formula to show that it does not expand because at certain temperatures certain elastic properties are limited by certain cohesive properties, etc. But this formula will not answer the question whether pressure exists because of force, or force exists on account of pressure; whether low temperature is caused by absence of heat, or whether heat is absent on account of low temperature.

All experiments of "creating heat by friction" are similar to that of the foregoing illustration. If Force cannot be transformed into mechanical energy, then mechanical energy cannot be transformed into Force (heat). The fact that heat is there may be accounted for in any one of several different ways. I will give

two or three. In any body, the changing of its characteristic form causes a strain. In elastic bodies, the force (heat) eliminated under the strain is immediately absorbed in regaining the form. In bodies where the structural form is permanently deformed, the conditions are different. As I have said before, the characteristic form is probably due to a variation in the form of motion, rotation, revolution, and size of orbit, and a variation in the systematic relation of the atoms in the molecules and also of the molecules themselves. With sufficient resistance, and the breaking down of the structural form, the force latent in speed of revolution and rotation might be transferred into increasing the size of the orbit (heat). Then, also, there might be air between the particles of material, which could be compressed, and, unless the experiment were conducted with more care than most of them are, there would be an apparent evolution or creation of heat under the pressure (friction).

The other way I will suggest seems to be the more probable. Under the conditions where such experiments have been made, there are conditions for great pressure or great resistance. Under such conditions the enclosed light atoms (ether electrons) would be subject, at some points, to a pressure that would change their characteristic form of motion, and this would, even if to a very slight degree evolve (discrete, not create) force (heat). The light atoms affected, in gaining their characteristic form would draw their force from a point where there was less resistance, which point might be remote. This theory would seem the more probable from the fact that, if the revolution of the frictional part be rapid enough, a magnetic strain will be established and electric force be evolved.

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Physicists do not accept the theory that magnetism and electricity are "a mode of motion," as they term "heat," nor that they can be *created*, but that only the *conditions*, for their manifestation can be created. Therefore, if we see *all* of these manifestations (phenomena) resulting from this single experiment, it hardly seems consistent to say that "heat" was "created," while for the others, only the conditions were created, and the magnetic stress and electricity manifested themselves. By mechanical energy, we compress air, and heat (force) manifests itself by expanding the adjacent material. By mechanical energy, we take off the pressure, and elasticity manifests itself. We say this is due to the heat (force) which it has absorbed from the adjacent material, which has, therefore, become colder. By mechanical energy, we may, under certain conditions, compress the ether, and force (heat), as magnetic or electric force, is manifest. The only difference I conceive in heat and electric force is the rate of revolution of the atoms from which they were discreted or the rate of the revolution of the atom which may be excited by their absorption.

Physicists commonly assume that all phenomena may be classified as matter and energy. I do not consider this as a suitable classification.

Matter, in the form in which we perceive it (material), cannot be, at least has not been, demonstrated to be simple, that is, composed of only one constituent. I conceive the material to be "formed" by the relating of two causes, Power and Force.

Energy, in the form in which we perceive it (mechanical), cannot be, at least has not been, demonstrated to be simple, that is, due to only one constituent. I conceive energy to be the result of the movement of the

material, caused, sometimes by Power, and sometimes by Force, and always the one cause limited by the other. Material and Energy are *both results* rather than causes.

I think that, classifying the causes of the manifestations as Power and Force will make the comprehension and solution of phenomena more simple, logical, and consistent. I have dwelt at much length on this point, as it is a critical one of difference between my conception and the orthodox, material conception.

Let us go over these changes. We started with the Force in the oxygen. After the union of the oxygen with the carbon, the surplus force expanded the iron, water, steam, and air. In this expansion something or another was moved. If it was not one thing, it was the other; and if it was the one thing, it was *not* the other. That is, if it was expansion, it was not displacement; and if it was displacement, it was not expansion. (Of course, both words *may* express the same meaning, but I here want them to express a difference.) We will choose to follow the displacement, which is represented by our piston head, which in turn represents all of the machinery imaginable in mechanical engineering, which finally, through our dynamo, gives the condition for a manifestation of electric force. When we compressed our air by a mechanical movement and evolved heat, we said the air, on account of its compressibility and elasticity, was the medium by which we could compel the force to manifest its energy, as mechanical energy. That is, the force, which was an integral part of the air was the medium by which one form of mechanical energy (pressure) was changed into another form of mechanical energy (expansion). Now, in the case of our mechanically acting dynamo, the ether, on

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account of its compressibility and elasticity, is the medium by which we compel force to manifest itself. We will now follow this force (electric force) through some of its mechanical manifestations.

Before taking the next step, I will refer to the character of the transfer. I conceive the transfer of this force along a wire to be by etherions atomic motion; that the whole circuit is just like an elongated magnet with the lines of force reversed. As this force is manifest on account of a specific amount of mechanical energy, it is proportionate to that amount of energy. The transfer of a given quantity in a given time may be in great quantities with low velocity, or in small quantities with greater velocity. The limits of transfer are more quickly reached by the first method, and we will take that first. The pressure is from within and the density is outside, with the tendency to go in. The lateral transfer is on the outside. The more nearly a wire synchronizes with the orbital movement of the electrons, the better conductor it is. The number of electrons that can be held is limited by the circumference of the wire. The transfer of force from electron to electron is practically with the same velocity as light, limited to a degree by the variation of the density of the electrons on the wire, etc. By the velocity of the current is meant the number of impulses given per second. These are limited only by the mechanism. When the quantity of force per impulse is greater than can be transferred, the wire is said to be overloaded. As I said before, a portion of the electrons are able to secure their normal amount of force, thus leaving on the wire a surplus of force, this surplus force not being able, under the excess pressure, to be transferred by the electrons, must be transferred by the atoms of the wire

itself. When the limit of the atoms for this work is reached, then the force is manifested in an increased orbit of the atoms of the wire. The increased size of the wire by heating gives greater capacity, and also greater proportionate waste (by synchronizing the motion to heat). By a continued overload the wire may be made hot enough to melt. This heat is the mechanical manifestation of the Force manifest by the magnet. This heat is wholly quantitative. There is no heat except as a material manifestation of the Force. Its *intensity* is wholly according to the quantity supplied, and not, in the least, due to the *way* in which it is supplied.

The heat supplied by combustion is limited by the *difference* in Force which the uniting bodies possess before and after uniting. The halogens seem to possess more Force normally than the other elements, but even they are limited in the amount with which they can part. While the light atoms possess a much greater ratio of force, the rapidity of vibration would prevent a synchronism, thus preventing a union with other atoms in combustion. Combustible bodies can only unite exo-thermally by getting rid of some of the force which, possessed by one or both, would hinder their synchronous union. To get rid of this force, there must be some body that is able to absorb it. That is the reason why there can be no combustion at temperatures exceeding a certain limit. Between $10,000^{\circ}$ and $12,000^{\circ}$ is the probable limit of temperature at which any two atoms are able to unite as a compound. Physicists acknowledge this as a demonstrable fact, and yet talk about the processes of combustion in the sun, the chemical action and reaction necessary for heat, etc. There may be some explanation given as to how com-

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bustion could occur at the temperature which is said to exist on the sun, but I have failed to see it. In the electrical furnace, the only limit to the temperature is the amount of force which, by the mechanism, can be made to manifest itself as heat. There must be great resistance of the material to create such a temperature, and this resistance reacts on the mechanism which is transferring the Force. Therefore, I say the temperature is limited only by the mechanism.

We have, by this method, already gone far beyond the point where any compound will be dissociated. In any conducting body, the dissociation is the same, whether the current passes through the body, or whether the body is subject to the high temperature. In fact, the effect is the same. The resistance of the non-conducting body results in the Force being absorbed by the atoms, and in the case of a compound, there is dissociation instead of heat, such as is manifest in a conducting body of high resistance. Sometimes the force is absorbed and utilized by the atoms in the way to which reference has already been made. Nitrogen as nitrates, oxygen as ozone, and the halogens (as chlorides, etc.,) especially, are manufactured commercially by the electric current, or the heat evolved therefrom. It will be interesting to note that, in such cases as these, when it requires a large amount of force for dissociation or concentration, under the reverse process there is an equally large evolution of Force (heat).

The products from this commercial use of electric force are not all of this nature, and it is these apparent exceptions that will show the weakness of any theory or conception that does not approximate to correctness. There are certain compounds that are so stable as to

require extraordinary force to dissociate, and it may be the inert element that is the one of value, and not the one that has absorbed the force. This is the case in the manufacture of aluminum, magnesium, etc. The oxygen, in uniting with these, evolves more heat, that is, gives up more of its force, than in uniting with other combustibles. Therefore, other elements have not force enough to separate the aluminum oxide, but under the great force in the electric furnace, the oxygen can get, or is compelled to take, the force essential to its gaseous form, and the aluminum is left. (That the actual operation is neither simple or direct, does not affect this explanation.)

There is another industry which may be mentioned here. The production of corundum, carborundum, diamonds, etc. Carbon in any of its forms is not easily fusible. The greater the density, the less heat ratio it possesses. Charcoal, under pressure, will evolve heat. After such a process, it requires more heat (force) to change it to a gaseous form, therefore, in its union with oxygen, not so many heat units are evolved, that is, not so much force is given off as a surplus. Graphite is a still more dense form of carbon, and the diamond the most dense of all. Carbon will fuse under the intense heat of the electric furnace. If on cooling it is subjected to great pressure, it will give up its heat (force), and crystallize. Under this pressure the same conditions may exist which occasion water to change into ice instead of crystallizing into snowflakes. The greater the pressure consistent with the formation of ice, the harder will be the ice, and so also, of the crystallization of the carbon. In this process we have: first the intense heat to fuse the material; then the intense pressure caused by the contracting

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occasioned by the material of the matrix cooling from such a high temperature; and also the ability of the carbon to *discrete* its heat (force) necessitating its absorption by the matrix, which in turn can radiate it; all combine to give the conditions for the production of the dense forms of the carbon. The Force does not enter into their production, only indirectly and in fact mechanically. The phenomena we have mentioned are the result of force transmitted with a low velocity.

Force as heat is never manifest except as a mode of motion. I agree with the conception of heat as a phenomenon, if it is distinctly understood that it is a specific manifestation of Force, and not the specific result of mechanical energy. A particular kind of mechanical energy enables or causes the force to manifest itself as heat, a mode of motion of the atoms which is solely a larger orbit than the normal, showing a greater ratio of force, and being abnormal, it is variable. This variability, or change in form, is what enables us to perceive that such a mode of motion as heat exists. In any critical analysis of the subject, note that when heat is perceived as a *phenomenon* it cannot logically be conceived as a *cause* of that phenomenon.

It seems more natural to conceive of atoms as rotating and revolving than to conceive of their having other forms of motion. On the assumption that the relation of Force to Power results in such motions, varying according to their ratio, then upon the accretion of a definite amount of force to the atom, there might result any one of fifteen different effects. The addition of force might affect the speed of rotation, the speed of revolution, or the size of the orbit; or it might affect any two of these in direct or inverse order, which would give six combinations; or it might affect all three in

inverse order, which would give six still different combinations; making fifteen different results. Supplementing these results there may be eccentricities in the orbits, which might be infinite. The ultimate condition in some of these series might appear to be the same. So in many chemical compounds the results might be predicated to be equal because the same elements are combined with equal energy, but there are many variations in compounds which are empirically known although they could not be *a priori* known. These differences I assume to be on account of the variation in the *procession* of the change in the motion of the atoms. Any one of these various results might come psychically from the Desire of the atom to act in a certain way upon the accretion of a specific amount of Force; or it might come physically on account of the manner of the form of motion of the atoms which *discreted* the force.

There must be a certain degree of synchronism of atoms to allow an exchange of force. For this reason the light atoms (ether) do not absorb (transfer) what is termed the obscure forms of heat. When the oscillations are of great frequency, then the force may be transferred to the light atoms (ether). These disturbances resulting in rays, are, according to their frequency (generally called length of wave) termed electric, calorific, actinic, and light. These disturbances or rays are dependent for the velocity of their transmission on the rate of the revolution of the light atoms. All rays of this nature travel with equal velocity. The result (that is, the character of ray), therefore, does not depend on the velocity of the transfer. Nor can it depend solely on frequency of disturbance (wavelength), or there would be no overlapping of effects.

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We have, then, only one alternative condition by which to account for the different effects. That condition is the *form* of *motion* as it is being transmitted.

We must realize that in the transmission there is no lateral movement of the atom excepting in the case of the enlarged orbit, which is a lateral movement equal to the increase in size of the orbit. In passing through material bodies, it is the form of the motion which is transferred, and not the atom. Therefore, other things being equal, the form of motion occasioning the least resistance from the material would be most easily transmitted. The forms of motion of the atoms of different materials vary. Those forms which more nearly synchronize with the specific form of motion that is being transmitted by the light atoms will more quickly absorb the force existing as such motion. This accounts for transparency or opaqueness of various materials to the various rays. Atoms of incandescent iron have a peculiar form of motion which form of motion is transferred by the light atoms (ether). This peculiar form of motion is more quickly absorbed by atoms of iron than by any other atoms.

The character of a ray depends: (1) on its origin, (2) on the transmitting medium. Our final analysis of the ray is also influenced by the character of the intercepting material.

It must be understood that an electric ray is as different from an electric current, or stroke of lightning, as the rays which issue from a flame are different from the flame.

We will take as the base of our next illustration a specific phenomenon which has already been given, namely, the electric spark which preceded the thunder.

We speak of a "streak" of lightning, but it is in reality

a spark or succession of sparks, passing so rapidly, or with an oscillation so frequent, as to appear continuous. We will treat it as one spark. This is a specific amount of force, abnormally large in relation to its atomic centre (which may be either an elemental or light atom). The accretion of force finally becomes so great as to overcome the pressure, and it is compelled to equalize through the path of least resistance. The reader should bear in mind the conception that force is *always* considered as coexistent with the motion of some atom, and that the motion may be greater or less than normal. When it is greater a transmission can be easily made to another where it is less provided there is a synchronism in the form of their motion. When the force has to synchronize their motions it is more difficult, but if the difference in ratio accentuates, the pressure or force reaches a point where some atoms will synchronize. This excessive amount of force existing as a greatly abnormal motion is finally transmitted, radiated, dissipated. The immediate effect of this dissipation of the force of our electric spark is to expand the adjacent material. This material exists as air and ether.

We will first review the atmospheric effects. We have already seen that there are two effects. (1) The mechanical movement of the material which may be felt and measured. This movement is transmitted with varying velocity. (2) The atomic movement which is perceived as sound. This movement is transmitted with uniform velocity.

We will now consider the ethereous effects. There are in the ether the same two effects. (1) The mechanical movement of the material. The mechanical condensation of the ether is an effect which is transmitted with varying velocity; a velocity bearing the same

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relation to light as the velocity of an explosive impulse in the air bears to the velocity of sound. I would call these transmissions the magnetic rays. They are really a strain of the ether (an absolute lateral movement of the ether). These are the transmissions which are utilized in wireless telegraphy. I predict that it will sometime be demonstrated that the velocity of these rays vary, while all rays transmitted by atomic motion will, of necessity, be of the same velocity, the conditions and medium being the same. (2) The atomic movement which according to the form of motion we perceive as four well-known variations, electric, calorific, actinic, and luminous.

(1). We will assume that the electrical rays result from an increase in the size of the orbit of the light atoms; such a change would mean an actual expansion in the material causing a rarefaction and condensation during the length of time of the oscillation. If the medium were not perfectly adiabatic it would result in a heating of its material. (We have, however, no method of measuring temperature in ether.) Ether being relatively incompressible is a superior conductor. Air being relatively compressible is a superior absorber. The mechanical movement of the air is transmitted, amount of energy being equal, to a less distance than the atomic movement sensible as sound. The opposite effect occurs in ether. The mechanical movement of the ether (as a magnetic wave) is transmitted, amount of energy being equal, to a greater distance than the atomic movement in the form of an electric ray.

On account then of the nature of these electric rays, the distance to which they can be transmitted is limited; in the first place by a limitation of the initial, mechanical, or material energy available; in the second place,

by the amount of Force which can be accumulated for transmission in the short interval between oscillations. The electric wave gives the condition whereby certain bodies are electrically charged and, certain electrified bodies are discharged. This condition is generally quickly neutralized, that is, the force used in such a way is absorbed (the form of the motion is converted).

(2). We will assume that the calorific rays are a variation in the speed of revolution. The varieties of oscillation that could effect the speed of revolution would be more limited than those that could affect the size of the orbit. All resistance due to mechanical pressure necessarily developed by an enlarged orbit is absent in a variation of speed of revolution, therefore, an equal amount of force could be transmitted to a much greater distance. We never get an electric ray from the sun, but we do get the calorific ray.

(3). We will assume that the actinic rays are a variation in the speed of rotation. It sounds mechanically reasonable to say that the rotation might be affected by a less degree of force. That is, the speed of rotation could be doubled with less force than the speed of revolution could be doubled. This assumption logically leads to the demonstrable fact that actinic transmission requires less energy than calorific transmission. It is transmitted through greater density and to greater distances.

(4). By assuming the luminous rays to be an excentricity of the orbit we have a variation of a form of motion which would require less energy than any other form of variation. This assumption corresponds to the fact that luminosity requires less energy than either of the other variations. Luminosity is limited so far as we know only by our organs of sight.

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I said that an equilibrium of the ether was quickly established after the "electric wave." In the action and reaction incident to establishing the equilibrium there may be traced the various motions as manifested in the great variety of special rays, to some of which I will refer later. Each of the five variations mentioned do not necessarily attend each impulse. The first two (magnetic and electric) are always inversely proportionate but never *entirely* separate. A certain amount of force evolved with sufficient frequency of vibration but with a relatively small degree of pressure gives an electric wave. A certain amount of force evolved with a sufficient frequency of vibration but with a relatively large degree of pressure gives the magnetic wave. An electric wave is transmitted by a variation of a movement of the atoms of the ether. A magnetic wave is transmitted by a movement of the ether. I will try to show this difference plainer by an illustration. Instead of varying the amount of force we will vary the condition of the medium which is to transmit the force. Let us take two long bars of iron differing only in diameter. Let us strike one end of each bar an equal blow with a mallet. The larger bar does not move; the smaller bar does move. There is a variation of the atomic movement in the large bar for we may feel that it is hotter. There is relatively no variation of atomic movement of the smaller bar. These two different effects may be combined by striking a bar of intermediate size, but of *necessity* the effects would be inversely proportionate.

For the electric wave and the magnetic wave the medium is the same but the application of force and the manner of its delivery differing, we get the different effects resulting from the variation either of the atomic

or the mass motions; never absolutely separate but always inversely proportionate. The heat or atomic motion of the large bar could be changed to magnetism, and the energy of the moving small bar could be changed to electricity. So in any complete cycle of an electric wave or a magnetic wave, these two forms of motion might and probably do equalize.

If we have a series of cog-wheels in rotary motion and apply additional force to one of the wheels, we will, if the force is properly timed or applied, increase the speed of rotation of the wheels; but if the force is applied too quickly, or in too great quantity to be absorbed, or in a wrong plane, there may be a movement of the mass of wheels but there may be no variation in their rotation. It seems, as these various conditions are known to exist as a physical fact in the material, it would be simple as a conception to assume them by analogy to exist as a relation between the atoms. Then by realizing that in solid, liquid, gaseous, and ethereous forms of material there are definite variations in the *atomic* motion, as well as measurable mass movements of the material, and then by scientific observation of facts properly relating these forms of motion, we might obtain a theory of electricity, magnetism, heat, light, actinism, and sound that would be consistent with itself, with each other, and with facts.

CHAPTER XVI

DISSIPATION OF ENERGY

THE great bugbear to physical science, according to the accepted dynamical theory of matter and energy, has been the ultimate ending of things within a comparatively short time. A few million more short years is all they can figure to give us on this mundane sphere. It seems to be with a sigh of intense relief that many of the scientists have accepted the atomic disintegration theory according to which the end will be postponed, and, "at one bound, the possible limits of time have been enormously extended." Of course, it is admitted that the extent of the probable duration of time is merely increased. You can take your choice of the eternal hell of the theologian, or the final, ultimate zero of physical science. I have already said enough to indicate that I should not accept either alternative.

On the assumption that there is only one source of energy, and that this energy must finally be dissipated by an equal distribution in the movement of the material, or by a separation from the material, leaving that finally inert, there would be no alternative in physical science. But, I do not admit this. I assume that there are two sources of energy—Power and Force; that it is the varied relation between these two that is

manifest to us as material and energy; that it is the Desire of the Power which fixes this relation and gives the characteristic forms to the motion. But, in the formation into complex shapes there is much conflict, and this result is as much a part of the conditions which govern as are the Power and Force, which are the causes. As I said before, there is no beginning to a cycle, but we must take a starting-point in following it.

We consider the sun as the greatest immediate source of energy. The physicists figure that, from the amount of energy we receive on a given surface, there must be a certain definite amount radiated into space. They estimate that 2,300,000,000 times as much is radiated as is absorbed by the earth. They demonstrate that, if the sun were composed of the most energetic of combustibles, they could not, in uniting, last more than 5000 years. When the dynamical theory forced this conclusion on them, they accepted the theory that falling bodies might give the necessary continuance of energy. Then again, some assumed that contraction would offset radiation, and claimed that a contraction of sixteen feet of diameter per year would account for the heat. To become convinced of the weakness of these theories one has only to note how quickly they were deserted when radio-activity gave a new source of explanation. Of course, this late theory would contradict the evidence of the spectroscope, but only in the absolute truth of a conception can there be an escape from inconsistencies.

In my criticism of radiation, I have already given an idea of my conception, but I will state it in another way, which, after what I have said about electricity may be more comprehensible. I conceive the sun to be composed of atoms as we have them on the earth, accepting

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the evidence of the spectroscope. I conceive that, under present conditions, there can be no combustion, no chemical action, no compounds. There is the same relation, atomically, between Power and Force. The absolute ratio of Force to Power may be great, as the great temperature would indicate. We cannot be certain, however, for temperature is but one of many ways of indicating this ratio. As an unstable body (and certainly large portions of it must be unstable, if we accept the measure of the corona), there must be great variation in pressure. Variation in pressure would act and be acted upon by the ether. Now, it is by these disturbances of the ether that we get our impressions of the sun. The old, orthodox idea that the ether is an unknowable medium that accepts all impulses and never gives back any, is contrary to the idea that action and reaction are equal and in opposite direction. So long as there is action, there is reaction, and to trace these each in the opposite direction, would be to ultimately establish a cycle. Within this cycle of pressure or action, there is a strain. This strain might be mapped out by lines of force the same as may be done with the magnet. No physicist supposes that, because these lines of force exist around a magnet, the magnet is "dissipating force or energy." The lines of force may be cut, the strain shifted, the energy transformed; all of this is acknowledged. I conceive the contest in the sun to give the same condition as is present in the magnet, modifying it by saying that the pressure in the magnet is to maintain its characteristic form, while in the sun, the pressure is from the unstable equilibrium of the mass, on account of the varying ratio of Power and Force. Also, the rapidity of the oscillation is such as to give the immediate effect of

the various rays. According to this conception, the ability of the etherous atoms (electrons) to maintain their characteristic form of motion equals the ability of the energy of the Power and Force in the atoms of the sun to disturb this form within certain circles, each circle being dependent for its size on the amount of force necessary for a variation from its characteristic motion. I claim that, neither within these circles, nor from one circle to another, nor beyond the circles, is there the slightest dissipation of energy; *excepting*, as bodies within one or more of these circles would, by cutting the lines of force, relieve the strain and absorb a certain amount of the force which caused it.

Let us, so far as we have gone, compare this conception with our conception of the magnet. We have a central magnet, and can demonstrate that it is surrounded by lines of force. We compute the energy exerted on a given surface of a piece of metal at a given distance, and we say that, as so much energy is being exerted on this surface, an equivalent amount is being exerted on all equal surfaces, *i. e.*, is being radiated into space. Of course, the absurdity of this as applied to the magnet is apparent, but the absurdity of it as applied to the sun has not been apparent on account of the mistaken conception as to the constitution of the ether and the undulatory theory of transmission. According to my conception, there is absolutely no dissipation of energy of the magnet, except as an absorbing body comes within the lines of force. If we drop a particle of metal, it adheres to the magnet, but every particle dropped will decrease the limits of the lines of force, until finally there may be no lines of force perceptible. We do not believe the energy to be annihilated any more than the physicists believe the

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radiated heat energy of the sun to be annihilated. Attempt to move a particle of metal from the magnet, and we find that the force is still there.

Of the bodies within the lines of force of the sun, we will take only our earth. There must be some circles which we do not intercept. Those we might term the limit of atmospheric disturbance, such as here we perceive as mechanical movements of the air from explosions; the atomic movement as sound; the electrical disturbances from varying pressure. There must be a strain within certain limits due to similar phenomena in the sun, but we are out of that limit, and all the energy of such phenomena must be still contained *within their circles*.

Conditions sometimes extend the next circle to include the earth. I will call this the magnetic circle. Conditions sometimes exist here when a strain will end in an explosion. The bursting of a "Prince Rupert Drop" may serve as an illustration of such an explosion in the case of a solid; and the action of a spherical body of water on a hot stove as an illustration in the case of a liquid. I conceive that conditions may exist in the sun where compression of the atoms enclosing a sphere may compress the contents to an extent that would eventually end in a bursting of the encircling envelope. The atoms at the point of rupture would be ejected with an unusual force. This energy would be transmitted as a lateral movement of mass in a certain direction, but which, on account of its ability to spread or disperse, could not travel as far as an atomic transmission. The only difference I conceive as existing in the cause of an electric wave and a magnetic wave is: the electrical disturbance is caused by a large quantity of force at low pressure (this may be, and is, quickly

dissipated as heat, *i. e.*, an enlargement of the orbits of the atoms); the magnetic wave is caused by a small quantity of force at high pressure (this wave may obviously be transmitted a greater distance).

As I have said before, I believe that the velocity of the transmission of this magnetic strain is somewhat proportionate to the intensity of the disturbance, with an average velocity throughout its effective limits approaching that of light. That this is a strain of the body of the ether is shown by its transmission not being intercepted by intervening bodies. Such bodies are affected, however, for the magnetic needle will turn to conform with the strain. The normal strain of magnets will be changed, and, in various ways, it is demonstrated that the magnetic disturbance is one of pressure instead of atomic movement. This hypothesis would also account for the spread of the nebulous emissions from a new star. These emissions spread in an irregular manner, as they would from an explosive effect, and with an initial speed ten to twenty times the velocity of light. Scientists have no acceptable theory for this speed, as light is their symbol of the greatest of possible velocities.

The next circle will be that reached by the variation of the light atoms (electrons) which I assume to be speed of revolution, and which we call the calorific rays. The next circle will be that reached by the variation in speed of rotation resulting in the actinic rays, and, finally, the circle where the eccentricity of the orbit gives the luminous rays. It may be said that the actinic circle extends farther than the light circle, as we are able to photograph stars that are invisible. But such a photography is a cumulative process made possible by a mechanism which will give a long exposure.

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If we could extend the surface of our eye or the telescope as we can extend the time of exposure, I believe that we might see stars that would make no calorific or actinic impression.

I have expressly stated that these various motions are given as an analogy. I do not believe that we can comprehend atomic motion, because it is not mechanical, not material, and, therefore, not comprehensible. But I do believe that these motions have a definite relation one to the other; that the movement of each class of atoms bears a fixed relation to the motions of other classes of atoms, and that these relations may all be expressed mathematically. In other words, it is the conditions which exist, which cause mathematics to be possible. That four is twice two, is not an arbitrary decision; it is so because conditions make it so. That the square of the hypotenuse of a right-angle triangle is equal to the sum of the squares on the other two sides, is not so because mathematicians have agreed to let it be so, but because conditions have made it so. While I may be able to comprehend this much of mathematics, there is more that I do not comprehend. But no matter how much of mathematics there may be that I do not comprehend, I do not conceive that any mathematical demonstration may be reliable if any of its assumptions are contrary to conditions; nor contrariwise could any conception of conditions be true that is contrary to mathematics. If a person claims to be mathematician enough to "square the circle," I do not believe him. If he claims to conceive a condition where the circle may be quadrated, I do not consider his conception reliable. All of which means that, while the truth of mathematics is fixed by conditions, conditions cannot be contrary to true mathematical demonstra-

tion. A mathematical demonstration is not necessarily a true mirror of conditions. It may be accurate as a demonstration; it may be arithmetically correct, but if all the assumptions are not correct, the result is invalidated. When I perceive a false assumption, I do not need to be a mathematician to disbelieve the resulting conclusion. I might apply this to many things; hypergeometry ("fourth dimension") for instance, but right here I will apply it to "rate of dissipation of energy." The assumption of the mathematician is, that space is absorbing energy from the sun at a ratio equivalent to what is supposed to reach the earth. There is no more real reason for saying that energy is being dissipated continuously by the motion of the atoms of the sun than for saying that energy is being dissipated by every movement of the atoms of the earth. I assume that the action and reaction between the atoms of the sun and the atoms of the ether are equal, therefore energy cannot be unlimitedly radiated into space. A certain amount of energy may be existent in the strain which exists, and the distance to which the action of this strain extends may be great, but there is a limit. Our earth is within the limit and so far as conditions differ, our earth may be said to absorb some of the energy.

If the sun can lose no energy except that absorbed by the bodies cutting the lines of force which surround it, that would extend the supposed limit of life of the sun without the aid of any impossible combustion, or a theoretic meteoric bombardment, or an inadmissible (radium) elemental constitution. But even this absorption of the energy by the surrounding bodies might eventually diminish the energy, though this could be done only by increasing the energy in these other bodies,

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i.e., by equalizing the conditions of all. It is not generally supposed that the earth is getting any hotter, as such a condition would necessitate. It may be said that the earth radiates the heat which it absorbs. The same argument applies to the earth which applies to the sun. The action of the radiation can extend only to certain definite circles, limited by the amount and intensity of the force radiated. Any radiation at an angle toward the sun would offset an equal radiation coming toward the earth, as it would relieve the strain that much; and any amount radiated away from the sun would tend to make up for any rays intercepted by the earth, and, therefore, requiring just that much less energy from the sun to replace. There can be no net radiation from the earth unless there is a body within its circle of action which can absorb such radiation. There may be a net absorption, but this is of such a small quantity as to have made no historical records. The results of such a conclusion as this may seem rather disturbing, but, in another chapter I will, I feel sure, escape from any apparent dilemma.

The conception that the ether is no more essentially different from other parts of Being than gas is different from solid, is, I think, a more simple conception. Under such conditions, however, the difficulties of the mathematician may be increased in computing the results of these variations in motion.

The phenomena of Being exists. I feel certain that the nearer we approach to the Ultimate Cause, the more simple its manifest movements (the phenomena). Because, the further along we get in the constructive forms of Being, the more complex it is. I do not mean by this that cause may be comprehended in the Ultimate, for not the simplest elemental thing is compre-

hensible. But I mean that the true conception will be the most simple. While truth may be stranger than fiction it must be more simple. This seems a logical necessity. A comprehensive conception must, however, embrace *all* the essential truths. There might be a conception of a Being more simple, and some Idealistic conceptions may be simple in their oneness, but they fail to include demonstrable facts, and facts constitute the truth and are a part of the Being we are endeavoring to conceive.

CHAPTER XVII

EARTH

OUR conception has logically brought us to the earth with practically little net energy absorbed from the sun, and certainly none radiated from the earth. Here we are up against a condition, not a theory. A man sitting on the hot sands of the desert is ready to swear that the sun is burning; and when night comes with its chill, and even ice forms under the straw at his side, he is equally ready to swear that the heat has been radiated. A man up in a balloon swears that the heat is not up there; so it must have been dissipated into space. Not being able to convict the man on the ground of perjury, we must either accept the conclusion or prove that the man in the balloon did not know how to look for the heat.

It is an accepted statement of physicists that the ether does not transmit rays from an obscure source. The method of preserving liquid air, and the various thermo bottles seem to give ample proof of this statement. The ether, however, is transmitting or returning all rays reflected from the earth; therefore, the only net gain to the earth is the rays that are actually absorbed, less any that may be given off by fires, etc., which radiate into the ether. We may see by this that only a small percentage of the rays are actually absorbed by the earth as a net *gain*. The heat, then, which we

have at the beginning of night is a small part of what is believed to have come from the sun all through the day. The absorption by the aqueous vapor is far greater than the net absorption by the earth's surface. We will follow first the heat which exists in the burning sand of the desert. This seems to be great, but, in reality, is much less than in a more favored location, the specific heat of sand being small. This heat is taken by convection, not by radiation, and the whole amount is transformed as a greater motion of the upper strata of air. The expansion of the upper strata means more heat, *i. e.*, force, but it would not be noticeable as temperature, for temperature is modified by conditions the same as weight. That is, there is no measure that will indicate the absolute temperature of any body. Any thermometer will indicate differences, but the differences do not have a fixed ratio under all conditions. We generally think that, when a body absorbs heat from an adjacent body, the absorbing body must first be colder; but this is not so. The characteristic form varies with conditions, and in the higher altitude there is a larger orbit (and possibly a swifter movement), which, being characteristic under the conditions, is not sensible as temperature. A specific mass of air secured at a high altitude would, if submitted to a pressure reducing it to a given volume, evolve more heat than an equal mass of air taken from a lower altitude reduced to an equal volume, due allowance being made for the difference in temperature. From similar demonstrations of this fact physicists say that air is not a perfect gas because it is not strictly adiabatic in its expansion and contraction. The superior ability of water to absorb the heat at high pressure (low altitude), and the superior ability of air to absorb

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heat at a low pressure (high altitude), is what causes the continuous and perpetual motion of evaporation and rainfall. In either case, by condensation of vapor or by convection from the hot surface beneath, the upper strata of air would be finally over-charged, if there were no process of getting rid of the accumulated heat (force). I will mention a few of the ways in which this is accomplished.

In the process of combustion, I said that carbon-dioxide was formed by the oxygen giving up some of its force to increase the size of the orbit of the carbon, the surplus being radiated. The carbon-dioxide is a gas, dense, to be sure, but if we were to endeavor to condense it to a liquid, we would have to expend considerable mechanical energy. This gas condenses itself with no expenditure of energy whatever. We know the gas is absorbed by liquid and with no elimination of heat; therefore, the process must be just between the endothermal and the exothermal, that is, it retains all of the energy (force) of a gas, while it really becomes as condensed as a liquid. The spontaneous, automatic action of this gas in preserving its equilibrium in the atmosphere is a wonderful provision of nature. If chemically absorbed by the water, it is carbonic acid.

Every way in which gases or liquids are intensified by the artificial electric current is an actual continuous process of nature. I have already referred to the condensation of oxygen and nitrogen. These actually absorb force in addition to the amount they possess themselves. Compare the nitric acid, which is one of such formation, with the carbonic acid mentioned previously. We see the nitric acid is much more energetic, which seems a logical result of its absorbing more force in its formation.

Another way in which heat is absorbed, is by the growth of vegetation. But this heat is not stored in the vegetable. The bulk of the plant is composed of carbon taken from the carbon-dioxide. The oxygen, beside the force which it retained in its condensing, takes a portion from the atmosphere, and is able to appear again as the gas oxygen (in which state we first mentioned it) with the energy which scientists say is stored up in the plant which it just left. But this energy of the oxygen did not come directly from the sun. It has absorbed it from the atmosphere.

Physicists figure on the assumption, that from the absorption of calorific and actinic rays perceptible on a specific surface, the same ratio of absorption is absolutely necessary for the total surface, just the same as there is an average rainfall over a certain surface even when the high places drain into the lower places. I claim that there is absolutely *no* energy taken but what is absorbed (of course, some of the reflected rays are absorbed indirectly). All rays reflected, as I said before, simply relieve the strain in an equal ratio. The leaves of plants are especially constructed to *reflect* the calorific rays. If plants required the heat of the sun to grow, they would not make such growth at night. You may say that this heat comes indirectly from the sun. The point I am making is, that there are ways for the heat to be absorbed from the atmosphere other than by radiation into space. This latter is the ordinary way of disposing of it, which I say is neither reasonable nor possible.

When, by the rapid condensation of vapor with its elimination of heat, and the natural increase of pressure, the heat thus accruing may not be absorbed in any of the ways previously mentioned, there may be dis-

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charges of the force, as lightning to the earth and to other intervening bodies deficient in force.

Then, in the third stratum of air, there is a lateral movement of the air of intense velocity, which would disperse the heat to the antipodes, relieving the condition more simply than by having to send it to the limits of the universe.

All of the ways given are known to exist, but have not been looked upon as having much bearing because of the *enormous quantity* of heat which was supposed to be constantly absorbed and as constantly being radiated into space.

One other way there is in which I think heat is absorbed,—not exactly another way, but an unorthodox application of the way. It is known that vapor cannot condense unless there is something to condense upon. A fall in temperature is not sufficient; there must be a nucleus. This is usually supposed to be a dust particle. In absolutely clean air, there may be supersaturation without condensation. If an electric discharge is sent into this air, the moisture will condense. A late theory is that the atoms are ionized and by having different electric charges the molecules of vapor are attracted and so condensed. I would not venture to differ with the physicists who have so magnificently elaborated the electron theory, did I not feel that a more simple explanation would suffice. It is known that certain elements will spontaneously condense endothermally: oxygen to ozone; nitrogen to nitre, etc. I believe that other less known elements have this power even to a greater degree. We know that in the air there are atoms of argon, helium, etc. In the quantity of air used in the ordinary experiments, as suggested above, the amount of helium would not be detected.

We will assume that, under an impulse of excess of force, so many of the helium atoms as were affected were to change their form of motion, in the same way as we have supposed the oxygen to do in forming ozone, and take the form of radium. In this change, possibly more force is necessary than the electric charge furnished, and it is absorbed from the adjacent atoms. The particles of vapor, in this way, may lose their heat (force) and condense around or independent of the atom of helium, which occasioned the change. By this explanation there is nothing new or unusual brought in. We know that this spontaneous condensation of elements does occur. We know that, under those conditions, the condensation of the vapor would follow as a natural consequence. We know that helium exists in a condensed form as radium, uranium, etc.

Except after extraordinary disturbances, the air in the upper strata is comparatively free from solid particles. It is known that there is a larger percentage of helium, argon, etc., in the upper strata of air than in the lower. Every part of Being is co-ordinated, so far as we know. And we know that every process of nature is reversible. If radium can be changed to helium, then helium can change to radium. If, in one change, it is exothermal, then, in the other, it is endothermal. Some of the products thus made might accumulate in the earth, and some might immediately reverse the action, which would account for the radio-activity of fresh fallen rain-water and snow. This seems to be not only a logical and consistent explanation of the phenomenon, but requires no new or unusual terms of expression. If scientists can figure the great potential possibility of energy (force) to be evolved from radium, then I may use their every argument to

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show the great potential possibilities of helium as a potential absorber of force (heat) from the atmosphere.

This seems to be a fit place to refer to radium. Physical science has its place in the elevation of human beings, but it is not an overstatement when I say that certain physicists are bigoted. Scientific achievement is measured by discoveries and inventions, but philosophic and religious advancement is no less great because less concretely measured. A short time ago liquid air was to revolutionize the world. Now, it is radium that is to prove our eternal salvation—at least, the eternal salvation or extension of the life of the universe now seems to hinge on radium, uranium, or their progenitors.

I will refer to some of the phenomena in connection with radium, showing how these phenomena conform to the conception I have already given. There is no more reason why radium and helium should be called different elements than there is that ozone and oxygen should be called different elements. So far as that goes, we do not know that any of the so-called elements are the ultimate, simplest form of the atoms which compose them. We know enough, however, to convince a reasonable being that, expecting to gain energy by changing one element into another is as futile as trying to get an excess of energy through perpetual motion. We cannot change oxygen to ozone and profit by the increased energy in the ozone. Yet, ozone, in transforming, gives oxygen and energy (force); radium, in transforming, gives helium and energy (force). The explosive energy of the transformation gives an initial velocity of from twelve to seventeen thousand miles per second. When this velocity is reduced to five thousand miles per second, it cannot be

detected. Thus ozone, in transforming to oxygen, or even water changing into vapor, might have absolutely the same action, different only in the initial velocity (which difference we know exists), and there is, at present, no way of detecting it. I believe the difference is one only of degree.

Let us take the phenomena connected with this transformation. There are three distinct effects, called the "a," "b," and "c" rays. The "a" ray is the expulsion of the helium atom by a change in the form of its motion. This is just the same as the evaporation of water. The actual change may occur in the interior, but is, of necessity, transferred to the surface to be manifested. The change of a molecule of water from a liquid to vapor is an explosion. Ordinarily, we do not notice it, for its initial velocity is not great, and the ratio of force to power is not so great. And, furthermore, there is no force eliminated in the transformation. The heat manifested is not evolved by the change. In the transformation of radium, there seems to be an evolution of heat, as in the transformation of ozone to oxygen. The immediate transformation of radium is proportional to surface, as in the evaporation of water, while the total force eliminated is proportional to mass, the same as in a heated body of water. We will suppose a body of water to be heated internally. The evaporation would be proportional to the surface from which it could take place, but the radiation of heat would be proportional to the mass. If this body of water could be spread over a large surface, the evaporation would increase in proportion, but the elimination of heat would not increase; therefore, the elimination of heat per square of surface would proportionately decrease. But, if this body of water is restored to its

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original vessel, no heat will be radiated for some time, as the force was used in the excessive evaporation. This is just the way radium acts. We increase the surface by dissolving it, and the emanation is increased, while, on condensing the solution, there are no "b" and "c" rays, and a reduced amount of "a" rays. Water must absorb heat before it can radiate it. But, on evaporation, much more energy is evolved than was apparent in the water so far as its temperature might indicate. Radium has been formed endothermally, and the force is inherent or latent in the form of its motion, which, we may say, is an increased speed of rotation of its atom. If helium had an affinity for any other element, so that this change could be effected with all the atoms at the same instant, we would have an explosive far exceeding anything we know. As it is, the change is limited by the pressure exerted by the changing atoms upon the others, and the reaction on the ether and the pressure exerted by that.

The "a" ray, or particle of helium, is positively charged, *i. e.*, has more force in ratio to power than is natural in its present condition. This force is now expansive as it is being eliminated; a specific part is absorbed by the adjacent bodies. The initial velocity of the change is so great that the ether is affected as well as the atmosphere. This initial velocity is not one of vibration, but of lateral movement, which is mechanically transferred to the ether, which, in turn, is condensed and we have a magnetic strain. That is, in the immediate vicinity, the light atoms (electrons) are proportionately more numerous and the force which is displaced is transmitted to the next circle, and in the enlarged circumference is finally absorbed or manifest as calorific or actinic energy. The condensed part, or

"b" rays, is negatively charged, *i. e.*, is composed of atoms deficient in force necessary to give the natural form of motion. The "c" ray is this surplus of force or positive charge. I said these rays were caused by the lateral movement of the explosion; I should have said, by the force eliminated incident to the explosion. The explosion, or energy of the explosion, ejects the helium atom a given distance, as the popping of a grain of corn will eject that grain a given distance. There is in the case of radio-active bodies an elimination of force incident to, or preparatory for, the condition of explosion. This is eliminated under a pressure which causes a lateral movement of the ether. A lateral movement is a mechanical movement.

I have previously described how the energy might be transformed into the energy of mechanical movement, and the energy of mechanical movement might again be transformed into atomic or molecular energy or motion. The actual transfer of energy in the case of the "b" and "c" rays is mechanical, although the first cause and final effects are atomic. Whenever the transfer of energy is by atomic vibration (rotation or revolution) it is subject to polarization, reflection, or refraction. Whenever the transfer of energy is by lateral movement of the atoms, it is subject to magnetic influence. One of these forms of transfer may, at any time, change to the other form; also phenomena like electricity co-ordinate both forms in the same transfer.

I spoke of the *emission* of radium; this seems to be one of the intermediate forms between radium and helium. There may be, as some suggest, in each atom of radium fifty-six atoms of helium. In each atom of the emission, there may be still fifty-five atoms of helium, and at each elimination of helium, there may be

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a change in the formation of the remainder. This is a theory which, whether correct or not, makes no material difference in my conception. In the emission itself there is no more energy manifest than in the radium. It is only when a transformation occurs that energy is manifest. Ninety-nine per cent. of the energy manifest is in the "a" ray, that is, the latent energy of the radium is manifest, as in evaporation of water, in the increased volume occupied by the vapor.

The "b" and "c" rays are incidental, and represent an elimination of force equal to only one per cent. The "b" rays, as I have explained, are the same as the rays from the negative, or cathode, of the electric wire. The "c" rays are the same as the "X" or Roentgen rays, and result from the lateral movement of the "b" rays. No doubt complexities of motion exist, but variation of forms of energy do not necessitate a variety of causes.

I wish, now, to refer again to the estimate of the mass of the electrons whereby the physicists say the old idea of the immutability of matter cannot be maintained. I have already shown how, in three different ways, a mistake could have been made: (1) In assuming that the total energy of velocity could be computed by measuring its lateral movement only; (2) in assuming that it must necessarily evolve heat (force) by contact, when it might absorb heat (force) by a change in the form of motion; (3) in assuming that there is no resistance of the ether.

I will now show where there might be another mistaken assumption. In the illustration given of the condensation of vapor by an electric charge, I said it might be from the change in the form of motion of the helium atom, with the absorption of heat (force) making

that a condensing nucleus for the molecules. The physicists say that each electron becomes or forms an ion, which becomes a condensing centre, and from the number of drops of water formed, they estimate the number of electrons ejected on a given charge of electricity. When the electrons of an equal charge are ejected against an obstruction, the heat evolved is measured, and from the velocity and the number of electrons as derived from the above experiment, the mass of each is computed. When from this experiment it is found that mass varies, it is asserted that attraction can be only an effect, subject to electrical conditions (force). This may be so, but the inference does not convince me. If the cause of the condensation is the contractive movement of the helium atom, then they have no basis at all for the assumption. Even granting that part of their theory correct it cannot be proven that every one of the electrons must necessarily ionize an atom. If there should be a mistake in the count of the electrons, there would certainly be a mistake in the computation of the specific mass of any one of them that would invalidate the estimate of the total mass.

Electrons, ions, waves, the various rays from "a," "b," and "c" to "X," like my orbit, rotation, revolution, various forms of motion, and ratio of Power and Force, are differences in terminology used in an endeavor to express a conception. The words themselves are of minor importance; the conception is important proportionate to its truth. Whenever any part of my conception is proved untrue, that is, contrary to fact, I will hasten to change it. But, when physicists state the results of certain observations as facts, and I see that the observations themselves are not based on

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facts, but on the assumption of a theory as a fact, I do not feel compelled to change my conception to conform to their conclusions.

It may be asked: If any of these conclusions of the physicists are not absolute facts, why are they so generally received? It is because they come nearer to according logically and mathematically with phenomena than do previous theories. Even if my conceptions were absolutely true, that is, free from error (which I do not claim), it would not be accepted by the physicists, because I am unable to demonstrate the theory mathematically. Their time is too fully occupied to be given to demonstrating the truth or fallacy of every hypothesis put forward. Therefore, making no claim to the attention of the physicist, I will leave the physical and mechanical aspects of Being, and take up the part which may be termed the biological.

CHAPTER XVIII

BIOLOGY

MY conception of Being reduces the difficulty of going from the inorganic to the organic that is usually met with in other conceptions. I do not think it necessary to appeal to an exterior power for life, or to bring in, by mechanical means from other worlds, the essential vital spark.

Before going farther, it may be well for me to define what I mean by "life," which is a characteristic of the organic. The above expression is really a definition. Life is a characteristic of organic manifestation. Life is not a cause; it is a condition. According to my conception, life is just like a flame; it exists so long as the conditions exist which make it apparent. It is the name of a condition. A flame is not a definite thing; it does not depart. There would be a great difference in the terms used were physicists to begin defining the condition designated by the word "flame." And so there are various expressions used among biologists to define the condition designated by the word "life."

My definition of life may not be universally satisfactory, but it fulfils the necessities of my conception. This is my definition: Life is a characteristic condition of a body, which, by a process of spontaneous assimilation and elimination, maintains its existence, identity,

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and essential functions. I say life is a condition, and I define the condition; what more can I say? I know that many enlarge upon the attributes of life. I say, life has *no* attributes, In the condition of life there is a process of essential functions, which process begins in the lowest forms with the assimilation of a neighboring atom and grows spontaneously until it reaches the point where in the higher forms there is the expression of a sensible idea.

In biologic writings, heredity is an effective term, but it is descriptive, not definitive. What is heredity? The transmission of like qualities from parent to child. What causes the transmission of like qualities from parent to child? Heredity. How lucid! How complete and unanswerable! It is no wonder that when one half the people stand in fear of the Great God and the other half stand in awe of Science, that the little god (Puck) with curling lip says, "What fools these mortals be". I am criticised for treating with levity such serious subjects, but I feel that I am more profitably engaged (although the profits may not be so great) when I am secularizing a sacred subject than were I, like many others in play and novel, writing seriously of lewd subjects.

When a cat is born with five toes from four-toed ancestors, what is the answer? Certainly not the ancestor. "No," they say, "it's a case of malformation," meaning, with the intent to convey the impression, that it is a mechanical deformation of the material. Try to imagine in a microscopic speck of protoplasm an embryo cat and try, even in imagination, to split its toe with a cleaver. Impossible, incomprehensible. Then my conception can be no worse. I say, in the organization of the atoms there was a misinterpretation

of instruction, literally a misconception. What is the difference? One is a physical conception, which tries to make the process mechanically comprehensible and *renders itself absurd*, the other is a psychical conception, which is absurd only because it acknowledges that the *process is incomprehensible*.

I believe the physical and psychical are inseparable; simply different aspects of the indivisible, and that to render comprehensible this relation or difference is as impossible as to demonstrate the difference or relation between the two sides of a geometrical line. Buckle insisted there was a difference and, therefore, not being defined, "no problem in geometry has been exhaustively solved."¹ I believe that so long as Materialists contend that the psychic is non-essential and that phenomena are occasioned wholly by mechanical means, they will be involved in absurdity. And I believe that so long as Dualists contend that God, the Spirit, is All (excepting only the Universe, which is his foot-stool; or is it the earth only which is trodden underfoot?) and that matter is only incidental, being immaterial and non-essential, there will be a growing lack of respect for their opinions.

My definition may describe my idea of the conception of life, but it does not, in any way, express a conception of the cause of the condition. Materialistic biologists claim that, given the first living organism, and it is mechanically easy to evolve the complex organisms following. Suppose that we follow them one step. We will take the first simplest form of bioplasm, a minute spherical form that must grow by a spontaneous assimilation and elimination. This it does for a time; but soon its limit is reached. The material assimilated

¹ *History of Civilization in England*, American edition, volume ii., page 342.

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must be from its surface; but its surface increases in a much less ratio than its bulk increases. Therefore, it is in great danger of starving to death. There is no *hereditary* instinct to tell it what to do; for this is assumed to be the first living form. There is only one way, then, in which it may be taught—that way is environment. And what is there in environment to teach it what to do? I venture the assertion that, if their life depended upon it, as, in reality, does the life of the bioplasm, there is not one out of ten human beings the world through that would know what to do to preserve life. Now, here is the first step in the evolution of the bioplasm, and conditions (environment) are as unable to aid us in making this step as it would be in originating the conditions. But the bioplasm does not starve for want of knowledge. It does the obvious: it follows and utilizes a self-enforcing law; it divides itself; its surface is increased and its bulk is decreased. It continues thereby not only to live but to multiply. Many of the succeeding steps of evolution are just as simple as they are obvious: a physical and mechanical necessity in the evolution of the forms. They are following and utilizing a natural law; but that in no way explains why or how the forms *came to take those steps*.

Dana says:

There is, therefore, in the living organism something besides mere physical forces, or the chemistry of dead nature, something that ceases to be when life ceases. There is a vital condition, in which molecules have powers that lead to resulting seed-bearing structures widely different from those of inorganic nature, and standing on altogether a higher level. There is a power of evolution, an architectural power, that not only exalts chemical results, but evolves a diversity of parts and structure and a

heritage of ancestral qualities, of which the laws of material nature give no explanation.

It seems to be granted that, given the conditions, the rest is comprehensible. Think for one moment what this assumption involves. Take the generative fluid of an animal; we know that this is formed out of wholly unrelated material, secreted and eliminated within the duration of a few moments, and yet, thus suddenly, we have this fluid teeming with organic, living forms. Does physics, mechanics, or mathematics aid the mind to comprehend this miracle? Not in the slightest. Of the origin of life upon this earth, I cannot give a comprehensible explanation, but I do say that when the germination of any living form is not comprehensible, that conception is the most logical which accords to each manifestation the same explanation. It is the Desire to be manifest in various forms, and, as conditions permit, these forms are manifest. Conditions may modify the forms, but conditions (environment) did not cause the forms. Whenever conditions permit, living forms are manifest. This is a parallel statement to the following: whenever conditions permit, snowflakes form. Apparently there is nothing in these statements to deny. We can make conditions where snowflakes will form. We know that it is one of the essential functions of the living body to make conditions where other living forms are manifest. We know the usual conditions; and the manifestations following create no surprise, although the formation of either the snowflake or the living form is absolutely incomprehensible. I say, given the proper conditions, and living forms will be manifest. Whether these conditions do exist or have existed independently of other

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living forms is a question I am able to answer only from results. I say there must have been such a condition, at least once, in the history of this earth. I have no such definite results to enable me to say whether such conditions existed more than once or not. Whether they have at other times existed in the past, or whether they will exist in the future, makes no difference according to my conception. Continuity of life is not an essential, although the decision on that point means the difference between materialistic evolution and special creation.

According to my conception, Desire is limited by conditions, and it is wholly a question of the conditions governing. Conditions might have permitted the manifestation independent of living forms; or, if the conditions permitted a more rapid development of the Desire through the forms already living, then, such conditions governed or marked the path of evolution. Future investigation may or may not settle this. It is possible that it may prove that special creations is a fact as well as evolution. It would seem that in the primordial period, chemical and climatic conditions existed where spontaneous generation might be more frequent, and an endless variety of monera might have had their beginning.

Whenever conditions permit, living forms are manifest. In view of our definition of life, this means that whenever conditions permit, there begins a process of assimilation and elimination, with the essential functions, which we call life. The condition which permits this organization is one that would be difficult to make chemically, and after we have it apparently chemically correct, there may be in the form of motion of the atoms or molecules composing it a variation from the necessary

conditions. In the conditions imposed for a test, boiling and filtering would destroy the unstable compounds essential for the spontaneous manifestation of life. The condition of the material is essentially one of great chemical unstability, permitting a variation and the building or organizing into a complex form or shape with the minimum of energy.

Aqueous clouds in the atmosphere sometimes have shape, but this shape is formed by the exterior resistance of the atmosphere. Actinic clouds sometimes have shape, but when in rarefied atmosphere, where resistance is at a minimum, forms are organized which appear wholly independent of environment. Such a large portion of them are co-ordinated and life-like as to preclude the idea of chance, such as occasions the life-like forms of some atmospheric clouds. Many aqueous forms of life are so fragile that on removal from their natural environment they collapse into a chaotic mass. I believe that when conditions permit, living forms are manifest in the actinic clouds, but they are of so transitory and fragile a nature that the slightest change of pressure will destroy the form. Scientists acknowledge spending hours watching these beautiful, apparently living, forms but in affirming the continuity of life, they could not admit that the forms organized in the actinic clouds were actually alive, even though that life might be brief.

Under the conditions of generation, as we know them, for every separate form that matures, there are probably a million which conditions do not permit to develop at all. No record remains of these undeveloped forms. So, also, there might exist, from the earliest ages to the present time, conditions in which life is manifest independent of other living forms, and if they did not

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develop we could never know it. If we find any developed, as we do find innumerable of the lower living forms, we cannot tell whether or not some have organized independently of other forms. Suppose, in the crude alchemy of those who have tried the experiment there should, by chance, be the proper condition, and life should manifest itself, such a miracle would be denied. But in case it could be demonstrated to the satisfaction of biologists, why, the whole materialistic world would have a jubilee, while the theologian would mourn for the loss of one of the few remaining prerogatives of God—the giving and taking of life. If life is a thing that can be given and taken, it is no less a miracle to have it given within the relation of the living forms. If life is a condition, it is no more wonderful, independent of other living forms, than in conjunction with them. In either or any of these cases, the actual organization of material into a living form is incomprehensible to the human mind. In cases where we cannot comprehend, I say we must only try to conceive.

My conception is, that Power and Desire (two words being necessary to express the one) is manifest as Being. That it is atomic in its structure, and that each atom has consciousness, memory, and volition; that each atom has related to it a certain amount of Force, which I characterize as giving it a form of motion. I do not conceive that one atom is independent of another atom, excepting in its individuality. How atoms can receive an impression, or act in accordance with a co-operative or organic Desire, is as incomprehensible as how there can be mutual attraction. We say gravity exists, and we know that organisms exist. The intermediate "How?" or "Why?" is only a conception. Is it comprehensible how human beings co-operate? Because

they have means of communication, you say. How? By means of their five senses, you say. The five senses are only five specialized ways of impressing consciousness; and what or where consciousness is, we do not know. Even the physical amount of energy essential to the perception is absolutely immeasurable. In other words, we are conscious of a variation of motion so slight as to be absolutely immeasurable, and we interpret these variations "sensibly," as we say. As a process, it is utterly incomprehensible. Only those who are fools enough to know "how" an apple falls will dispute this.

With this admission, is it, then, any more absurd to conceive that atoms may consciously receive and respond to impressions that are immeasurably slight? Materialists conceive that atoms are mechanically forced into position according to an immutable law. Dualists conceive that each atom is guided into place by an exterior God. Monists believe that each atom is spontaneous, but unconscious in its movements, and that consciousness is a result and not a cause. I conceive that the atoms are just as conscious as we are, but are not conscious of so much as we are, because through our organic body consciousness is subjected to a greater variety of impressions. I call the Power in each atom its "mass."¹ Some speak of mass as

¹ By mass I mean quantity of Power, and not any *separate* manifestation of Power. A pound of feathers *may* have the same mass as a pound of lead, and with each in the same location it is the assumption that they do; but I do not admit it or deny it, for we have no data showing the relation between gravity and cohesion or whether or not they may be invertible. My impression is that they are the same, only that gravity is the material relation of measurable bodies and that cohesion is an equivalent relation between the immeasurable parts of these bodies; and that whatever law may be applied to one relation may be applied to the other.

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being inherent in the atom, but this is not technically correct. We can easily conceive that, if all the universe were annihilated but one atom, that that atom would have no mass. As the mass of an atom is dependent on the relation of one to all, so the Desire of the atom is not inherent in the sense that it is separable. The mass of an atom is never different, or subject to change; the Desire of an atom may change and certainly varies. (It might be substituted that it is the interpretation of Desire that changes.) While the mass (power) does not change, its manifestation changes according to conditions. The same mass may weigh twenty-five pounds in one place, and one hundred pounds in another place. So, of the Desire; at one place and time it may be one hundred pounds of inorganic material, at another time and place this same material may be a highly complex organic body. The change in condition has allowed this difference in manifestation. Whenever conditions permit, these higher forms are manifest. It is the intent of Desire to make these conditions, but, as I have said before, Desire is limited by time, as Power is limited by space. The same conditions under which bioplasm could generate and develop, might not permit the development of man.

I think the idea of the theologian, that the Power (God) has complete control over conditions, is extremely untrue in one direction; and the idea of the Materialist, that Desire (Mind) has no influence at all over conditions, is extremely untrue in the other direction. The time fixed by biologists for the evolution of man is anywhere from 100,000 to a 1,000,000 years, which time would seem all too short, were there no causes for variation other than environment. When conditions permit, life is manifest. So fast as conditions permit,

forms of life more complex are manifest. It is not necessary to affirm that the original conditions permitting the manifestations of any form of higher complexity will never occur again. The procreative condition given may fully satisfy the Desire for the continuation of that special form. According to material evolutionists, whenever the original conditions arose again, there would of necessity be an independent generation of a similar species; or, in other words, the conditions under which any fixed type or species were formed have never reoccurred. According to my conception, if the Desire was satisfied with an existing evolution of a specific complex form, it would not again begin developing that form on a lower plane.

Given two twelve-room residences, they may have been built under different conditions. One may have started with one room, and as the necessities or requirements demanded, the additions, room by room, were made until it became a residence well calculated to fulfil all the requirements of a family. The other house, we will say, is built according to an architectural plan, having in view the ultimate requirements of the family. Even if this house is built room by room, according to the conception, the *condition* of its building is different. It is easy to see that not so many conditions would necessarily delay the completion of the second house as the first. Suppose we were told that two houses were erected under the above conditions, which one would we expect to show the greater architectural beauty and practical adaptability? The first plan is according to the Materialistic evolutionary idea. The second plan is according to the Dualistic idea. Materialists say that the second method is possible only on account of the experience derived from

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the first method, and, according to their conception, this objection is unanswerable. I do not believe that experience is limited in its meaning to a knowledge and recollection of things already done. I believe that knowledge enables us to predicate conditions that have never before occurred. We say, a child learns by experience; but it may learn by instruction or the knowledge of others. In this sense, knowledge is equivalent to experience. Now, I believe that the knowledge of the Supreme Being is fully as much greater than that of the human part of Being as the knowledge of humanity is greater than my individual knowledge, and I am not so egotistical as not to admit that this is quite a difference.

I have been criticised for having a conception which limits, in the least degree, the knowledge of the Supreme Being. I am asked what limits I put to this fore-ordained plan. Some lower forms of life plan for the future a few months; some human beings plan ahead for a few years; does the Supreme Being plan ahead for a few centuries or a few æons? I would not care to define the time by measure, but, should I say a million years, it would seem to me less absurd than to say that the plan extended to all eternity. By saying this, we limit eternity by the plan, which must be limited to be definite. A definite plan is essentially limited. Eternity is essentially unlimited.

I have said that Desire (in which word is incorporated the idea of knowledge, but not omniscience) is limited by time. This not only means that the fulfilment of a certain Desire requires a specified time, but that the plan and knowledge thereof are necessarily limited by time. We measure time by the rotation and revolution of the earth. Any plan or knowledge regarding

the earth must be limited by the duration of the earth. This seems indisputable, and as there is no reason for our interest at present extending beyond this, I do not feel that the conception should be criticised as too limiting on account of my limiting the plan to terrestrial time. The real point is not that the plan and knowledge may be too incomplete or too extended, but that the manifestation of the Desire according to any plan is demonstrably subject to conditions. I conceive that there is a plan, a definite aim, a design, an ultimate, to be accomplished by Desire, but that conditions may modify or even change this Desire in its manifestation.

If this conception is true, then the condition of neither one of the two houses referred to is illustrative of Being as manifest. If the first, or evolutionistic, conception were true, there is no explanation of the perfect adaptability of parts or the architectural beauty of the complete forms, such as we see in nature. If the second, or Dualistic conception were true, then there is no explanation of the defects of construction or of the unusable and even objectionable parts of the material forms which demonstrably exist. This condition, then, is more accurately illustrated by a building started on a definite plan, for a definite purpose, but in the construction of which, conditions arose which caused the plans to be modified and the structure to be altered, with here and there a possible defect caused by interference from some exterior source.

The Materialist does not comprehend his law, or why it applies; the Dualist does not comprehend his God, or his mysterious ways; I do not comprehend Desire, or the methods of its manifestation. The only advantage I claim for my conception is that it is more consistent with observed facts. I realize that, in

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proportion to the novelty of this conception, it will appear absurd; but I do not believe that the conception is essentially absurd.

In olden time, the existence of both God and Baal was acknowledged, but there was a contest as to which was the greater. In modern time, the existence of both God and the Law of Nature is acknowledged; and there is a contest as to which is the greater. I might say, with the Atheist, "There is no such thing as God"; or I might say, with the Monist, "There is no such thing as the law of nature." In this age the idea of the separate existence of God and Baal seems to us absurd. The time will come when the idea of the separate existence of God and Nature will be equally absurd. In just the degree to which that idea becomes absurd, will my conception cease to be regarded as absurd.

It used to be supposed that there was an absolute difference between a solid, a liquid, and a gas. While, in definite cases the difference is absolute, yet the conditions and cases vary so much that no definition of any of the three can be used to differentiate them and accurately apply to all.

It used to be supposed that there was a difference in the flesh of a fish and the flesh of a fowl. It used to be supposed that there was an absolute difference between vegetable and animal, but it is now known that the two merge so closely that a body may be part vegetable and part animal at the same time, or vegetable part of the time and animal part of the time. It is also beginning to be recognized that the line of demarcation between the living and the non-living is not as definite as is usually supposed. I claim that the difference is one of condition only; that there is no more real differ-

ence between protoplasm and bioplasm than between a particle of water and a snowflake. I do not conceive of a *vis viva*, a vital principle, a living energy, or any *thing* that may be implied by such expressions.

If we will stop to think that our consciousness as a human being (on the material plane) has nothing to do with the construction of that human being, and has no perception of how that being functions, we may realize that consciousness is not at all synonymous with life. Consciousness is an attribute possessed by all atoms; life is a condition resulting from an aggregate of atoms. One separate atom cannot be alive; therefore, there cannot be an *individual life*. When an amoeba divides, forming two, neither of them can be said to be the progenitor. A slip may be taken from a plant or a tree, and grow to the size and likeness of the original. A worm may be cut in twain, and each part grow into a perfect whole. There is no individuality in life.

In the spermatozoa we see an apparently perfect, living form, needing only the food of the ova to enable it to develop and mature. In the fertile ova we see a development that demonstrates it to be a perfect body, each part differentiating into its appropriate organ. In each of these cases, the physical development seems to depend only incidentally upon the other. In some forms of life this is so in fact. In others, and most of the higher forms, in the union of spermatozoa and ova (combination of the gametes) there is a perfect coalescing, an inter-absorption and re-formation, which we might say was a re-generation. This process refutes the idea of a continuous individual life.

Tracing life from the lowest forms to the highest, and tracing the life of any given body from its inception to its end, there seems to be no proof, or even suggestion

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of oneness and individual separateness. At some point in the life of each living body, there is a degree of merging with another, which fact dispels the proof of individuality. Working up from beginning to end, with all the physical and material data obtainable, the logical and consistent conclusion is that a living body is a combination of separable parts, and that no one part is the essential representative or soul of the whole. If my life may go out as a flame and my body disintegrate to its original forms, where am I?

CHAPTER XIX

EGO

IN closing the last chapter, "I" was in a dilemma. The Ego, as an individual, seemed to have slight claim to notice or existence. In spite of the evidence, I cannot help believing that "I" exist separable from my life and my body. In all my conception, this is the most absurd of the assumptions, because it is, of all of them, the least capable of substantiation. Although I suppose that nine-tenths of the human race believe it, yet it is with some diffidence that I proclaim, with Elihu, "There is a spirit in man, and the inspiration of the Almighty giveth him understanding."

What is this spirit, this Ego? It may be well to state first what it is not. It is not divisible, and, therefore, it is not the body; it is not a condition, therefore, not the life. By the word "soul" many may have the same conception which I give to the word, "Ego," but the original and authoritative use of the word "soul" makes it synonymous with life. In but two places in the Bible is the soul referred to as existing after death, and in those places, only in an allegorical way. I believe that Christ and the majority of his followers thought the soul might become immortal, that is, that life could continue undetermined and the Kingdom of God be established. When results showed

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that this belief was, apparently, unfounded, there was a gradual reinterpretation, which placed the Kingdom of God in the heaven above, and made life die to live again, and thus making it possible for the "soul to be saved." Of course, controversy on Biblical interpretation is futile. I have said this much to show that the use of the word "soul," for the purpose of defining an immortal entity, was without authoritative sanction until of recent date, and the fact that it is now so used does not carry with it the right of asserting that it was used in this signification two thousand years ago.

From the physical standpoint, there is nothing to differentiate man from the animal except as a *genus homo*. The brain development is only one of degree. Every faculty of man has its counterpart in one or the other of the lower animals. Is there anything in man inherently or intrinsically different or superior to other animals? Compare the most degraded of mankind with the most intelligent of animals, and it must be admitted that man, at least, is not superior. And from this admission it is easy to say that the only difference is the construction, which permits of a higher degree of development and a greater comprehension. The Materialists and Monists come to this logical conclusion. Physically and mentally, I agree that man is but a superior form of animal. The physical corresponds to Power, and answers the How? The mental corresponds to Desire, and answers the Why? How does the bioplasm divide? Physically, by Power. Why does it divide? Mentally, instigated by Desire. These are not really separable, but are accentuations of the different phases of life.

But there are limits to the mental development of animals. They have no aspirations, no inspirations.

"There is a spirit in man, and the inspiration of the Almighty giveth him understanding." This spirit, assuming that it exists, I will call the Ego, and it is through this that man has understanding. Granted that an animal may learn to count; no one pretends to think that an animal can appreciate mathematics. Some men appreciate mathematics. Why? There is no more appropriate answer than "the inspiration of the Almighty giveth him understanding." It may be said that the intuitions of animals are parallel to the inspirations of man; they are parallel, but they lack the essential nature of being aspirations.

Saying that the Ego is a spirit makes it no different physically (if I may use the word in this way) from any other atom. It is simply the specific atom through which the Desire is to manifest itself in the highest form. The elephant and ape, the horse and dog, do not have aspirations; not because they are physically incapacitated, but because the Desire for the spiritual understanding has chosen to come through man, or has developed a form through which it may come.

If understanding and comprehension depended on brain development alone, the animals would make some degree of progress. It has been said that, through observation and experience, man has developed his understanding; but I believe that inspiration and aspiration have been the prime causes of man's development, and these are not faculties of the brain at all.

This, then, I claim, is the only reason why man is a superior animal; he is the chosen instrument of spiritual inspiration. The physical and mental development is a co-operative one. Man's animal desires are not of the Ego, but an aggregate of the Desire of the organized atoms. The spiritual aspiration is not of the body,

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but of the Desire. It is only through the Ego and its body that these aspirations and inspirations can be manifest.

I will go back a little to the conscious perception of impressions. Our impressions must all be interpreted sensibly, *i. e.*, through one of five ways. We are powerless even to *conceive* what consciousness may perceive on the atomic or spiritual plane. On the material plane we know there is a vast difference in the perceptions, and there is fully as much difference in the final interpretation of these impressions. The way these perceptions are interpreted is generally a matter of training. Place a city man and a country man in the same environment, and each would perceive some impressions that the other would not, and of the perceptions common to each, there would be a difference in their interpretation. The brain interprets. How it does it I do not know. I said the physical and mental development was an organic development, and not individual. When a cow sees corn in an adjoining field, and looks for a low place in the fence to jump over, it shows mental development. There must be a degree of comprehension to allow the optical impression of the corn field to be interpreted as something at a distance and not in the eye. There must be a degree of comprehension of distance and dimension. These interpretations are mental. I could give illustrations to show that the mental processes extend back to the very earliest stages of organic life or even to inorganic processes. But it is sufficient, at present, to state that comprehension is a process of the brain and not an attribute of the Ego.

¹The impressions are not limited to exterior sources, but there are perceptions of thoughts or ideas, a con-

sciousness of purely mental processes. We assume that a dog dreams, and if this is a fact, then the dog is conscious of a mental process. The mental process of the human brain is more complex, and, therefore, comprehension is greater. But if comprehension were limited to exterior impressions it could not embrace a love for mathematics, or philosophy, or for any abstract idea.

The greater the ratio of mental impressions to those from exterior sources, the greater the chance for mistaken interpretation. Experience has taught us this, and, therefore, says measure each mental impression by exterior comparison. In other words, be guided only by concrete reason. This is one of the fallacies of an intelligent mind. History shows that the greatest ideas of the human race were inspirational; that is, at the time they were conceived they were contrary to reason. This is a fact. But it is also a fact that the greatest advance of mankind has been made when governed by reason. There is a vast difference in these statements. Reason is not meant for a guide. Reason is consequent on observation and experience. Reason is the result of the past; it is not the precursor of the future. Reason is the rudder which is to prevent the erratic course of the mind. Reason is *not* the guide. Nothing in the past may be a guide to anything greater or higher in the future. Bibles and saintly examples, science and philosophy can guide us to nothing higher than they themselves have reached. I wish strongly to emphasize this point. Reason and morality are not guides, but governors. Think over the wonderful steps in the advance of civilization and you will see that each was, at the time, apparently unreasonable, and was derided by the multitude. Precedence prevents

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progress. But do not expect to push progress by a too previous process. If you have an inspiration, let it mature. The immature is unseasonable; therefore, remains unreasonable.

Returning to the perceptions of the Ego, we may acknowledge that many of them are hallucinations, *i. e.*, they are misinterpreted. Physical, mental, and spiritual perceptions are all subject to this misinterpretation. Physical perceptions are from sensual impressions. When a man has "Bats in his belfry," or "Snakes in his boots," we say he is suffering from hallucination. It is simply a case of the impression being misinterpreted to consciousness. A man may have weird and wonderful ideas that are useless and absurd, and he may think they are equal to the Theorems of Euclid. In these cases, generally, the portion of the brain which gives us reason, does not properly function. There are exceptions (of which De Quincey is a notable example) where the consciousness perceives, through reason, that the other perceptions are misinterpreted. A sensual impression may, in its ramifications through the brain, be interpreted to consciousness as a dream. Reason is in abeyance. How the brain thinks, and how the organs secrete, are alike incomprehensible and *may* be in no way comparable. These are involuntary actions, but to a degree are subject to control. As I have said before, the functioning is not as a mass, but is the organic action of the atoms. We suppose these atoms are separated by distances relatively far greater than the distances separating the units of an army. Although action at a distance is acknowledged incomprehensible, yet it occurs in a wonderfully intricate form.

The impressions, perceptions, and interpretations

are not, in any measurable or comprehensible way, mechanical. When the impression of a pin-prick is made, it is in some way conveyed to the ganglia, and it is some one or more of the atoms composing this that is conscious of the impression, and it is the function of the ganglia (the atoms organized in this form) to interpret these impressions, and it (one or more of the atoms composing it) issues orders not only to one set of muscles to contract, but to the apposing set to relax. It is not the muscle which is conscious of the order, but the atoms which are organized as muscle and whose function it is to act. Conceiving this all to be atomic may seem extreme, but it is consistent, and anything short of this would not be a logical conclusion. In conceiving the atoms of the ganglia and muscles to be conscious, it is not necessary to suppose that they comprehend what the pin is as we do. But as to that, how little do we comprehend how the pin-prick is translated into pain. We cannot, at least I do not, conceive of the slightest similarity. The interpretation of every physical impression may be called, to a degree, mental. All purely mental perceptions must be interpreted in physical (sensible) terms. While every psychological *action* must be a physiological action, the two are not necessarily equal to a given mechanism. A pin-prick occasions the arm to jerk; the jerk is more than a transformation of the energy of the prick. At some point there was an interpretation from sensory to motor. That this is more than the moving of a switch or lever releasing a given amount of energy can be shown in various ways. One is sufficient: the same sensation or a like sensation may be variously interpreted. The answer, that it is because it awakens different ideas, does not show that the process of

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awakening ideas is of necessity in any way mechanical. Experimental psychology may in the future come much nearer tracing the actual material and physiological process, but I doubt that it can be made in any way mechanically comprehensible how a physical impression can become consciousness, or rather how the spiritual can become conscious on the material plane. The existence of physical or sensual impressions, and the mental impressions or ideas, will be acknowledged by all. But that the third class of impressions, the spiritual inspirations, exist and may be perceived will be admitted by few.

As this point is one of the most important to my conception, I must try to define just what I mean by it. Theologians claim for the Scriptures a spiritual inspiration. But they conceive of the inspiration as automatic and infallible, like the working of a perfect printing press; that God spake and man wrote. But "God's thoughts are not our thoughts." In other words, the inspiration is always subject to interpretation, or misinterpretation if there are two or more ways of interpreting it. Many of the great and sublime writings, I believe, were inspired, but because they were inspired, does not make them necessarily true. Many that are true have been preserved, and many that have equal claims to inspiration have, because of their unworthiness, been relegated to oblivion. According to my conception, an inspiration is not necessarily infallible.

The theologian expressly disclaims that any secular knowledge could be of inspirational origin. I claim that the physicist and philosopher may be inspired to an equal degree with the priest and the prophet, and from the same source. It may be said that the Desire of every atom is an aspiration or an inspiration to that

atom, but I prefer to use these terms as applying solely to the Ego. The Ego I will define, then, as the atom through which Desire is able to make itself conscious on the material plane, and give aspirations and inspirations to a human being.

Materialists say that man is no different from a dog except in form and in function. Materialists seem to think that form and function are incidental, that function is dependent on form, and can and will progress only as environment will permit. Immortality is not considered.

Monists say that man is no different from a dog except that the function and form are so high that it (its highest form, consciousness) may be immortal. Monists conceive the form as the essential, making function, which they claim is first, therefore its creator, dependent on form, the creature. They conceive that function and form are each unpremeditated; that conditions shaped form, and that it is only on account of its value in functioning that the highest form (consciousness) merits immortality; having no logical reason for a belief in immortality except that it has proven too good to be thrown away. Immortality is incidental.

Dualists say that man differs from a dog not only in form and function, but by having a soul (whether created for the body or by the body is not definitely stated), which shall be judged by the deeds done by the body; and when the body which did these deeds dies, like a dog, the soul is sent to eternal damnation or salvation. Dualists conceive of form and function as wholly incidental; man is of no more value than a dog, except so far as the results of the functioning are a test of the soul. Immortality of the soul (spirit) is the essential.

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Now, I conceive that function is the cause of the form, except when modified by conditions, though I realize of course, that this is an old, metaphysical problem which admits of no settlement. The essential nature of each is on account of the manifestations (results) that may be effected by the functioning of the form. I differ from the Materialists because I believe that the form and functions are manifestations of an intelligent plan not yet completely fulfilled. I differ from the Monists because I believe not only that form is for the purpose of functioning instead of function following on account of the form, but that consciousness, memory, and volition are not *functions* at all. Consciousness, desiring to function, gives the organ of comprehension; memory, desiring to function, gives the organ of recollection; volition, desiring to function, gives the organ of will. I differ from the Dualists because I believe that the form and function are of *essential importance*, and that immortality, instead of being of essential importance, is of no importance nor worthy of consideration except incidentally. Preaching a doctrine of getting the mind off the *essential* while here and placing it on a problematic existence in the hereafter is, according to my conception, the height of folly.

I have, as little as possible, blamed the English language for my inability to convey concisely and definitely my various conceptions. But it really has limitations. When I say "I am hungry," and "I long to hear again that beautiful music," does the "I" in each sentence really convey the same meaning? Does not one convey a physical conception, and the other a mental? Again, when I say that I believe the statement, "Ye shall know the truth and the truth shall

make you free," and affirm that I ardently yearn for the truth; and when I affirm that my ardently yearning for the truth, so far as I can perceive, is not primarily for the freedom which I believe will follow, though this freedom may be physical, mental, and spiritual, does this "I" convey the same meaning as in the other cases, comprising the same and nothing more? It may to some; I think that it will not to all. In each case we will say that the "I" is the Ego. In the first case, the Ego is conscious of an impression interpreted as a physical need. It originates in the physical body. It will be satisfied only by providing the substantial physical requirements. In the second case, the Ego is conscious of an impression interpreted as a mental need. It originated in the brain from a recollection of former impressions. It will be gratified only by a transmission of mechanical energy, so small in the ultimate that the final amount required to fulfil the requirements will be immeasurable. In the third case, the Ego is conscious of an impression that is interpreted as a mental and, possibly, as a physical need, but it did not originate in the physical because it is not an essential physical requirement; and it did not originate in the brain, or it would then have been in the form of a recollection of former impressions.

The aspirations for something intrinsically better than has been given in the past, though it may be as physical, mental, or spiritual, I conceive as coming from neither brain nor body, and, therefore, from the Desire. Desire is manifest through the atoms. Each atom has not only a personal Desire (or as I have said before, each atom is a part of the Desire), but taken together each has an organic Desire, which might be termed a consciousness of the *necessities* of the *organism*. There-

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fore, when I say "I am hungry," neither the Ego nor any single atom of the body is hungry; it is simply a perception of a condition. When the *brain* is given a mental stimulant, probably the unstable atomic condition is impressed with a degree of energy relatively as great as is manifest in the *stomach* when it is impressed by food.

Without going into the question as to what constitutes pain or pleasure, I use the foregoing to show that, while each atom has a Desire or willingness to cooperate, the forms then manifest are not, or only in an incidental way, expressive of the personal desires of the atoms. In reaching this conclusion, we see that, if any human being exists who has no aspirations, that human being advances the Desire only in so far as he may indirectly be mechanically available to aid others in manifesting their inspirations. We may say that countless millions of germs are formed on the chance that some will germinate. We may say that countless bodies are formed on the chance that some will be useful. I say, on the contrary, that every germ and every body is useful, but when there is germination or availability, it is more useful.

If any human being exists without an aspiration, it might be denied the name according to the conception that the Ego is an essential part of the human being, as the atom which allows Desire to be conscious of these aspirations and inspirations on the material plane. There may be such a being in human form but I doubt it, still, abnormal conditions may prevent one's consciousness of aspiration and of inspiration. Aspirations are precedent to inspirations. To a man who does not want to know any more of the truth, it is useless to reveal the truth. By yielding, then, to aspirations, we have the condition prepared for inspirations.

I claim that every advance, from the lowest human form, has been through aspirations and inspirations. The alchemist and astrologer may have been acting under inspirations no less than the chemist and astronomer whose names are famous. Who can prove whether an original idea is a mental suggestion or spiritual inspiration? They come; they possess us. The inventor may measure his ideas by mechanics; the physicist may measure his by law; the poet may measure his by meter; the mathematician may measure his by formulas; the philosopher may measure his by logic; the preacher may measure his by morality; "the crank" may have no measure at all. In any case, the measure, reason, was not what produced the idea.

Let us condense the foregoing. To every Ego there is (1) Aspiration, to which, if one yields, there follows (2) Inspiration, which, to be of value, must be correctly interpreted (measured) by (3) Reason. Let us see what has prevented a rapid advance according to this sequence. First, I must emphasize the point that the manifestations of the Supreme Being in the material form are limited by conditions. I owe no allegiance to any God who can personally write his laws on tablets of stone and who does not break them himself over the heads of some who maliciously disobey them. Aspiration, inspiration, and reason have been subject to conditions of development. Suppose many people to have possessed the aspirations of Newton; we may easily formulate many reasons—various bodily necessities; numerous sensual desires; infinite mental inabilities—to account for their inhibition. If to a million people the suggestion were given that the same influence caused the tides to rise as caused the apple to fall, how many would have pronounced it absurd? And of

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millions of millions, how many would have taken the trouble or the time to investigate or demonstrate the truth in such a suggestion? If aspiration, inspiration, or reason could be propagated separately, there might be more frequent manifestation; but each is dependent on the other for the elucidation of a new truth. Above all, the result of wisdom is but to a small degree cumulative, except insofar as it gives us a larger collection of admitted facts. Yet there is no doubt that the average brain of to-day is of slightly greater capacity than in the past, and there is no doubt that the accumulated facts give greater latitude to reason. That is, an inspiration might to-day be admitted as reasonable that would not have been so admitted even a few years ago. With the average brain of greater capacity, there will be here and there one above the average, and of these, there will be here and there one with aspirations and inspirations, and greater range of reason will permit a comprehension and proper interpretation. So the conceptions of truth will multiply in a greater ratio in the future than they have in the past.

There is one thing we all recognize which I think is an equal barrier to manifestations of aspirations and inspirations, and this is, I believe, a psychic entity which I term, Fear. It exists as fear of lack of physical necessities. The great majority of mankind must spend their energy in earning a living, with scant time to entertain an aspiration. Many a man would trade off his chances of attaining his aspirations for an insurance of his bodily necessities. It also exists as fear of ridicule. The fear of bodily harm from the Inquisition is now happily passed, but we know it was a barrier in its day. This fear now exists in a different form, such as the fear of public opinion, social ostracism, etc.,

which are nearly equally oppressive. There are many who fear to express an opinion that may seem heterodox. This fear is not confined to theology. It may seem stronger in religion, as there is the additional fear of Eternal Damnation (which, as a matter of fact, I do not believe is nearly so strong as the fear of the adverse opinion of people), but it exists in politics, society, and societies. Loyalty to the legion is of far greater importance than loyalty to the individual conception of truth. Tolerance is a gift of the gods, and it is no coincidence that the nearer a man comes to God, the more tolerant he becomes; which is also equivalent to saying, "All who say, 'Lord, Lord,' shall not enter into the Kingdom." On every side, we see this fear. The poor fear poverty; the rich shudder under the responsibility of money; society fears a loss of prestige; authors fear the loss of fame. In some form or other we all fear our fellow-men. At present we are powerless to escape from it.

Does not this word "fear" embrace practically everything in our life which makes against happiness? For every Desire there seems to be some offsetting Fear. I believe that every form of fear which conflicts with our chance of happiness may be eliminated by the proper co-operative effort on the part of man toward this end.

CHAPTER XX

DEVIL

A PREACHER once told me that while he did not understand very well my philosophy, one thing he did like about it was that I retained the Devil, whereas the modern tendency, not only in philosophy but in religion, was to abolish the Devil. Logically, I must, of necessity, retain the Devil. In the orthodox presentation of the Devil he seems quite a suitable foil for the One Who engraved on stone the expressed fear that, "Thou shalt have no other God before me." Of course, so long as we make the Devil a lesser god, we are not breaking this commandment.

While probably nine-tenths of the people in the world believe in a Devil or Evil Spirit, it is not with the hope of in any way satisfying these that I assume the existence of a Devil. In fact, I do not believe the orthodox theologian will be any more pleased with my devil than he is with my God. The creation of a Devil on a philosophic or scientific basis would hardly be orthodox. There is orthodoxy regarding the Devil as there is regarding other religious things. As my conception of a God embracing the whole universe in a Supreme Being seems more sublime than the ordinary anthropomorphic one, so is my conception of the Devil extremely different from the prevalent one of a personage with horns and hoofs.

I have made the broad statement that the Supreme Power and Desire is manifest as a Supreme Being, which is the Universe. But, I also said that Power in materializing required an opposing Force; that every atom of Power had related to it a specific but changeable amount of Force. Scientific philosophy does not recognize either as a cause, but all measures of phenomena are in terms of some manifestations of Power. It is only in the electro-magnetic theories of the last few years that Force seems to have undue prominence, but in all these phenomena the measures are in terms of Power. Power has a material manifestation; Force is manifest only as motion. Even then, it is not Force that moves; it is the atoms (Power). Force is, indeed, the Prince of Darkness, for it is always hidden and only manifest through Power. As one of the causes of motion, existing only as motion, this expansive Force (as heat) is also well typified as Lucifer; always red, the calorific color, and truly the signal of danger.

If we assume Power to be conscious (and I hardly see how one escapes from that, as an assumption or a conclusion, for if human beings only are conscious, we ought to be able to overpower anything that is unconscious), there seems to be no logical reason why we should deny consciousness to Force. In fact, when I maintain that atomic action is not mechanical, it becomes logically necessary to assume Force as conscious; otherwise, the change of Force from one atom to the other would have to be a mechanical change. To draw a consistent conclusion, we must say that every mechanical *change* is simply apparent, and in reality is the sum of many atomic changes; that there may be a mechanical movement as of a rolling ball,

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but a mechanical change is a mass of atomic changes, each of which, voluntarily or involuntarily, is a conscious move in response to an impression, the change being according to the interpretation of that perception. This is a logical conclusion; it is not an absurdity. That it is novel, I will admit. But, if one will free himself of the conception that consciousness is a product of the brain, it will not seem so extreme an assumption, for something *must* be the seat of consciousness.

Again, I have said that *our* consciousness, as human beings, is on the material plane and limited in its interpretation to the five senses. Does any reasonable person wish to maintain that there could be no conscious movement or perception except within the limits of movements which we know compose our sensual impressions? Unless this is maintained, consciousness cannot be assumed to be a function of the brain only. Impressions are perceived and actions are performed in an intelligent manner by the microscopic protocooccus; and the conjugation of the spirogyra prove that there is communication at a distance. Take from consciousness the idea of comprehension and there should be no difficulty in conceiving every atom to be conscious. Force, not being atomic in its structure, would not be dividually conscious.

Assuming Power as attempting to manifest its Desire as a corporate being, the Force either attempting to prevent such formation or to destroy any body already formed, Force being an essential opposite to Power in its material manifestation, is thus a necessary evil, or Devil. To me, this is not an allegory based on mythology, but a statement of the absolute truth, *a condition from which all similar ideas have had their origin*. It is difficult to prove the existence of Force

in physics; it is even more difficult to prove the existence of a Devil in psychology.

If Force is a necessary Devil, then all form of evil is necessary. The saying that "Fire is a good servant, but a poor master," could not have been more truly worded if the originator had then in mind the Devil or evil.

I have already brought out the idea that "I desire food" did not mean that any atom was hungry, or that the Supreme Being was suffering, but that a certain condition was perceived by the Ego (as well as the other atoms of the body) as abnormal. An abnormal condition was said to be a variation in the correct ratio of Force to Power. There is always an effort on the part of the atoms to regain a normal condition (normal not being absolute, but relative). The condition of abnormality (so far as atomic consciousness may be compared to our material consciousness), I conceive to be one of pain, and the normal one of pleasure. This variation in impression is the one conveyed to the Ego from any organ of the body. If everything were in its right relation, or with a slight deviation, I think that this would afford a correct guide, but the abnormal might become the normal, and thus the perception is an incorrect guide, as in cases of perverted appetite.

"Dirt is matter out of place," and "Too much of a good thing is good for nothing," are sayings that apply in this connection. Most things are not intrinsically evil, but an excess may bring pain. A continued excess may bring a chronic abnormality called bad habit, which condition, under most cases, will cause pain to correct, as the abnormal had become the normal. These are all physical or mental impressions, and are indirectly representative of the personal Devil.

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Is there anything evil that bears the same relation to the Ego that aspiration and inspiration do? I think there is. As I said, it could not be proven that a given impression was an aspiration instead of a suggestion, so we cannot prove that a given evil impulse comes from the Devil instead of from the brain. I really believe that many physical, mental, and spiritual deformities are caused by continued obedience to evil impulses. After the abnormal condition exists, it is easy enough to assert that the cause is physical or mental. But, in the beginning, does it not seem rather difficult sometimes to trace the cause to heredity or environment? If the Ego is an atom, it must have its specific ratio of Force. Really, when one comes to think of it, it sounds orthodox to say that every man is more or less possessed of the Devil. It seems as though certain typical forms of evil, as fear, anger, hatred, envy, etc., were in some cases as difficult to relate to physical or mental impulses as it is in some cases to show that certain inspirational ideas have their origin from exterior sources. We will use one of these as an illustration.

It is said that "the fear of God is the beginning of wisdom." I agree with this and might add that "the fear of God decreases in direct ratio to the wisdom gained." This is only another way of saying what was said in much better language some two thousand years ago: "Perfect love casteth out fear." If God is love, and Fear is the evil, could it be worded better? If Force is essential to Power, physically, then Fear is an essential concomitant to Desire, psychologically. In the beginning, Fear is an essential. Fear warns the mind as pain warns the body; both are indicative of evil. In the savage state the first recognition of a Supreme Being is a Fear of the harm that such a Being

might do, and there is an endeavor to propitiate such a Being. Oh, how firmly fixed is this conception of the Supreme Being! But where fear may be necessary in the beginning to guard the person, it is not good to incite it in others. The impulse to cause fear and suffering so commonly seen in youth, and many times never corrected or outgrown, may be an ancestral trait, but I think it more consistent to say that it is a natural trait following an impulse of the Devil on the Ego.

Fear is not only a mental evil, but a physical one as well. We all know that after being frightened, or when recovering from a fit of anger, the system is deranged. This is an actual physical effect. There is a frequently repeated story of how a mother nursed her baby after a fit of angry temper, and the baby died from convulsions caused by the poisoned secretions. This may be fictitious, but it is not fiction that the bite of a mad cat, rat, or dog is far more dangerous than it would be if not so irritated.

Some years ago a certain chemist secured secretions, from various sources, of people under the influence of fear, anger, or pain, and in such cases the secretions were poison to animals inoculated therewith. Coloring the secretions with certain reagents showed that there was a marked difference chemically. A secretion from an angry person showed up quite red, and the story went the rounds of the press that "sin is red." A different reagent, however, might color it green. In further experiments it was found that animals inoculated with secretions from persons under the influence of a special pleasure or good impulse showed benefiting and invigorating effects.

Suppose the human being could, for years, be freed from all unnecessary fear, anger, envy, etc., and instead

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of these injurious emotions have substituted perfect love and a maximum of unalloyed pleasure, should we expect the organs of the body to be benefited? Would the brain function more freely? Would there be a better chance for aspirations to be received and inspirations to be perceived? Let us try it.

CHAPTER XXI

JESUS CHRIST

MANY clericals have, on a variety of occasions, and in rather peremptory tones, asked me, "What are you going to do with Jesus Christ?" While I do not recognize the authoritative right of any one to demand an answer, I am willing to answer the question in the spirit in which it is asked.

I believe the Lord Jesus Christ to be an historical personage with a record much more meagre than I would desire. Two or three lines ascribed to Josephus and a few pages in the Bible, the cullings of some thirty thousand odd manuscripts, embrace it all. It is not agreed whether or not Jesus spoke the words ascribed to him; but some one spoke them, and I will give him the credit. According to my idea (and I have as much right to my interpretation as has the next one), the literature the world over will not produce so many sayings portraying the true conception of Being. I take His sayings literally (excepting, of course, the parts with which I do not agree, and those, like any other preacher, I take figuratively). The conclusion to which I come regarding Him is that He was absolutely sincere. As a miraculous, know-it-all God, He would not be impressive. But he was a man of lowly origin, humble, sensitive, lacking the invulnerableness

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of the egotist, and filled by inspiration with wonderful ideas regarding the most important subject in the world, our relation to the Supreme Being, ideas that were as contrary to orthodoxy as well could be.

He conceived that God was not a person, nor a respecter of persons, nor a respecter of days; that he was not worshipped in temples made with hands; that he cared not for the blood of sheep and goats; that sacrifice would not be pleasing to Him, or bring salvation; and above all, that the Kingdom of God was right here, and it was up to man to possess it. Try to imagine a sensitive person filled with this wonderful idea, and filled with the aspiration to convince and save humanity, going out before a bigoted and perverse generation with such a conception.

Nothing is written that would give the impression that Christ was an egotist or megalomaniac, and whenever He delegated to Himself God-like proclivities, it was as one of the common brotherhood of man. He stood in God's place; so does every other man. He was God manifest in the flesh; so is every other man. He is the Son of God; so is every other man. "Is it not written in your law, I said Ye are Gods? say ye of Him, Thou blasphemest?"

Christ had the ability of healing the sick, as many have had since, but He was honest. He did not say that it was a personal power. "Thy faith hath made thee whole." It is not recorded that He charged two dollars for absent treatment. But it is recorded that "He did not many mighty works there because of their lack of faith." He seemed really to believe that people might be saved from sin, sickness, and death, *here*. He did not give very specific directions as to how this was to be done. His commands were few.

He did say, "Love thy neighbor as thyself." "Perfect love casteth out fear." "This is my commandment, that ye love one another." And "Fear not at all." A lot of deaconly sharks will bend every energy six days in the week to getting the better of their neighbor, meanwhile trembling in fear lest the neighbor should get the better of them, and then meet in solemn conclave on Sunday and confer about the boy who played ball the Sunday before and cursed when he got hit, and "church him," that is, put him out into eternal damnation. Do you get indignant? What is the use? Fuming over conditions will not remedy them. Christ got indignant and drove the money-changers from the temple. But they came back, and are there still.

While Christ did not give many commands personally, those he did give were very simple. They are beautiful; some, peculiar in style, are called the "Beatitudes." Not one of the simple commandments of Christ is used, literally as recorded, for a test of Church membership. They are too sacred for every-day use. As a matter of fact, the present conditions of society will not permit an obedience to them. And furthermore, simple obedience to them would not bring the higher life and the Kingdom of Heaven. Christ realized this, and for guidance He directed man to go to the source of inspiration, the Spirit of God. "I am the way, the truth, and the life." "I," the "Ego," there is where man must look for direction. Christ's whole life contradicts the interpretation that he supposed that He, personally, was a way to life. He *often* spoke in God's stead, as when he said, "I am the vine, ye are the branches."

"Jesus wept." Why? Did you ever think of any logical reason why He should weep? If you were a

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person of unusual power, and you should happen upon a family with an apparently incurable affliction, and, when by a word, you knew you could cure it and change all this grief to joy, would you sit down and weep? Let us look at it from another standpoint. Here was a family with which He was intimate; to whom He, no doubt, revealed His ideas in a most intimate way. Perfect love casteth out fear; mind receptive to the Spirit of God, and faith in the power of God would save man, giving him life and establish the Kingdom of Heaven. Yet, here in this family, where of all places He might expect results, what does He find? One member dead and buried; another member meets Him with the story, stating that if He (Christ) had been there it would not have happened (implying a delegation of special power which He always repudiated), also affirming that she was convinced there might be life *hereafter*, instead of in the *here* as Christ taught; and the third member at home in hopeless despair. Assuming that my interpretation is correct, would it not be cause for a man to weep? Is it not enough to make a God weep to witness the apparently hopeless blindness of the human race?

There is a modern tendency to shy at the miracles. Could there be a greater miracle than raising a man four days dead? I have said life is a condition. Some years ago, if a person had been under the water and remained unconscious ten or fifteen minutes, his condition was considered hopeless. Now, it is not considered hopeless after an hour, two, or even three hours, and many physicians say there is only one sure test of death, that of decomposition, the condition in which Lazarus was supposed to be, but it is not stated that he was really in such a condition.

Take the temptations of Jesus Christ. According to the common interpretations, they are rendered ridiculous. Could a man with millions be tempted to give it up for dimes? Could a God be tempted by a Devil? But suppose we view it after another fashion. Here was a poor carpenter, who, through listening to aspirations, had given time to telling mankind of His inspirations by which He conceived that man was the manifestation of God Himself in the flesh, and that through this manifestation He wished to establish His Kingdom on earth. This poor carpenter found Himself possessed of unusual powers, which He believed were not essentially personal, but which might be possessed by any one who would open his mind as He had done to the aspirations and inspirations of the Father. "Not these works, but greater than these shalt thou do." When He said, "I am the way; no one cometh to the Father only through me," the context would lead me to conclude that it meant not that they must follow him personally but that they must come the same way He did; not through any *exterior* plan of salvation or sacrifice, but through the reception of the Holy Spirit.

Especially did He emphasize that they must listen to the Word of God. By this He did not mean the books of the Old Testament, for, when he referred to them, He said, "The Scriptures." He did not mean the books of the New Testament, for they had not been written. And much less did He mean His own words. Of the three hundred times this expression, Word of God, is used in the Bible, not in a single instance does it refer to or mean the Bible itself. It always means the Spirit of God speaking to man.

In spite of all His efforts, His words were misinter-

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preted and His object misunderstood. He was reviled by some, envied by some, feared by some, honored by a few lowly ones, but none comprehended His inspiration. After three years of preaching, He saw that it was a useless effort, an impossible task. The trial must end sooner or later in some way or another. With what influence He had, and with a little catering to orthodoxy, He might be elevated to a position of honor. With the power He had of healing the sick, He might suppose He could become rich. He must have believed that almost any position could have been His by working for it. These were the temptations. Yielding meant the giving up of His aspirations to convince mankind that His inspirations were correct and from God. But they were hopeless anyhow. Possibly, by waiting, and after obtaining riches and honor, He might then be in a better position to help mankind. This insidious form of temptation, I believe, has transformed and deformed many an aspiration and inspiration. Riches, honor, position! How much good I might render humanity did I possess them along with my good intentions! It sounds plausible, but Christ concluded that man may be saved and elevated only in one way, that is by listening to the Word of God.

I have not the slightest idea that Christ thought that by His renunciation He would be elevated to a seat at the right hand of God. He had been asked, "If a man die, shall he live again?" without answering or possibly being able to answer the question. I think to one imbued with an inspiration, the question of the reward does not appeal.

Consider Jesus Christ for a moment in this position. On one side *everything to gain*, riches, honor, position, and with these apparently the only practical hopes of

doing any good to his fellow-man. On the other side, *nothing to lose*, as His task was apparently hopeless. Nothing to lose but His God-given aspirations, and of what use were they? And were they God-given? He, a poor peasant of Galilee, pitting His opinions against those of the intellect and piety of the ages. The suggestion may have forcibly impressed him that He *was* wrong in His conception, and that His power was given to Him personally to use for the benefit of mankind. Would it not be flying in the face of Providence to *refuse* to use it as His friends in high position advised? Everything to gain, and nothing to lose. My friend, did you ever have an aspiration, or inspiration, and give it up for less? I have. My fear of conditions outweighs my faith in Power. I am the proud possessor of a little reason which I allow to govern. Christ was led by the Word of God. But, after refusing to accept everything, what would nothing benefit His fellow-man? Living in honor, His immediate followers would look up to Him; but in living without following His aspirations, His life would not permanently benefit humanity. If He continued His work, He knew that He, like many another, would be crucified for His opinions. Not that these opinions mattered to those others, only that they were bringing Him into a prominence which the "powers that be" could not tolerate.

Now that death was the alternative chosen, how could that death be made to benefit man? If He simply gave up and died with no especial preparation, He and His message would speedily be forgotten. If He made his departure too spectacular, they might centre their thoughts on Him and venerate Him as a departed prophet, reverencing His words and honoring His memory, possibly thinking of Him as one of the Gods.

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But neither way would advance mankind in a realization of the conception He taught. Study His preparation for death in the light of this dilemma and according to His conception. His followers did not comprehend Him then; how could He aid them to do so by His death? In His farewell talk, He tried to impress upon them His conception, with the method of continuing and developing it afterward. In reiterative language He said, "I am in the Father, and the Father in me." "I am in my father, and ye in me, and I in you." "Abide in me and I in you." "I sanctify myself that all may be one." "If I go not away the Comforter will not come unto you; but if I depart I will send Him unto you." "I will not leave you comfortless. He shall give you another Comforter, even the Spirit of Truth." "When He, the Spirit of Truth, is come, He will guide you into all truth."

He gave none of the current orthodox phrases: "I'm going home to glory, be good so as to meet me in heaven." By the promise to return again, Jesus gave them hope of living. He tried to impress upon them the fact that God was a spirit, conceived of and worshipped only through the mind, that He could not appear only as manifest in the flesh, and that man was His representative on earth, who, by heeding the aspirations and inspirations given by the Holy Spirit of God, would be instrumental in establishing here the Kingdom of God.

When we realize that it was not until years after, when the hope of His second coming had been abandoned and a general reinterpretation given to His words to make them conform more nearly to conceptions of God previously existing; when the leadership of the Holy Spirit had been given up and there was drawing

by lots for those who should be delegated to lead; and when manuscripts were collected and a small part declared authoritative as representative of Christ's life and teaching, and only that part declared canonical which could be interpreted to represent the conception of the Church at that time (three hundred years after); then, by so realizing, some may see that the interpretation which I give is warranted by the records.

As an interpretation it may be right; it may be wrong. I would not dogmatize. It satisfies my ethical ideas and religious feelings, and were I able to meet Jesus Christ, I should fear nothing from Him for my frank answer to the preacher.

While on this subject of Biblical inspiration, I must say a little more. I do not believe that a thing is true because it is in the Bible, but I believe the Bible to be the most wonderful of books, because it contains so many wonderful truths, and it seems to me that many of them could have been conceived by man only through inspiration. Many things recorded in the Bible could not have come by observation. The first chapter of *Genesis* is the most wonderful account of creation extant. As an automatic, infallible production direct from an Omniscient Being, it may be subject to criticism (though I think time will even lessen that), but, as a guess at the evolution of mundane being, it should be a scientific wonder. But, before this was written, some one must have conceived the idea of One God. Some one must have been founder of the Hebrew race. In the Bible this is credited to one and the same person, Abram. From the ability to conceive of a God, and the aspiration to be his representative, and the inspiration to let his children and his children's children be this God's chosen people, it would be a natural conse-

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quence that the results were such as manifested. Later on, laws were conceived for the government of the race. Nowhere is there a compendium of law equal to the Ten Commandments. It is claimed that they are copied, or adaptions. But, whenever they were first conceived, they were inspired. I claim that it is an impossibility for man from physical impressions to have conceived a precept better than he himself, for in that case, the creature would be better than the creator. I claim that every advanced idea is by inspiration. As I have said before, this maturing of the inspiration depends on aspiration and the reasonableness of the perception as interpreted to consciousness. As a physical, verbal agreement between a Supreme Being and man, the Mosaic conception appears to me as ludicrous as Paine and Ingersoll have pictured; but to a human being at that stage of development, such a conception of man's relation to God is sublime. If man would obey the laws, he would live long upon the land which the Lord God had given him. And to keep this fresh in their minds, there was frequent sacrifice to obtain the blood of the covenant, showing that the testator was dead and they were really heirs, and as gods, stood in his place, and must, therefore, be good and make the land fruitful and multiply. It is adaptive to a degree, for all conceptions, to be comprehensive, must be adaptive to appeal to the people. But, as a conception, it is equal to any in history. The mistakes arising under this covenant were many. The law is weak, and it is only a makeshift. Through a later inspiration, it was perceived there must, in time, be a change; another covenant. They, the Hebrews, God's chosen people, had failed under the law which God had given them, and a means of salvation would finally come.

The new covenant was prophesied. What was this new covenant promised them, and to which, by faith, they looked forward, and by their faith preserved themselves a unique people in the world? Jesus Christ thought and taught that all people might become heirs under the new covenant. By this conception he incurred the ill-will of His own people, the Jews, and was reviled by the Gentiles, for who, at that time, would want to be heirs of the Jews' God? Christ died an apparent failure. Many a tear have I shed in sympathy for Him—something I never did when I believed Him to have died a glorified God. His disciples *believed* in Him and expected His return, but it is plain that they did not comprehend His teaching. The perception came to Paul of the truth of Christ's conception, and with such force as to nearly paralyze his mind. This mental paralysis (ecstasy), under conscious perception of a great truth, is a matter of record in many cases, and is a well-known phenomenon to psychologists.

The logical mind of Paul soon began to fit in the teachings of Christ to the previous conception of God. Not all of Paul's ideas or logic are correct. When he said that the graft partakes of the nature of the vine, he was mistaken; when he said that a seed must die to live again, he was mistaken; and we have just as much right to think that when he gave, as being literally true, the quotation that Jonah was three days in the whale's belly, he was again mistaken. These are not proofs that there is no inspiration, but illustrations showing that all that may be written under inspiration is not necessarily infallible.

Paul brought out forcibly the idea that, according to Christ's conception, the time of the new dispensation was come; that Christ was the mediator of the new

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covenant, and that, to make it more forcible, He had given His own blood, which sealed the covenant, and that under this covenant the old dispensation had passed and the old law was of non-effect and that they were all heirs under the new covenant. The new covenant, or testament,—what is this new testament—this revised will of God? If an attorney went before a judge and stated that his clients were living under a will or testament that he was prepared to show was superseded; that a will or testament of a later date had been found, and according to its terms should now be in effect, and he wished the old will with its requirements to be set aside, and that his clients be allowed to live and inherit under the provisions of the new will, the judge would ask him to produce his new testament. Now, suppose at this point the attorney should say, "Well, judge, I cannot produce the exact testament, but I can tell you the tenor of it. I know what it means. You can take my word for it. I know just how the people should live under this new testament, and I have a lot of books written about it, called the 'Books of the New Testament,' which I will submit, if you wish." What would be the probable reply of the judge? We will assume that this is what the judge (people) said to him: "Why, you are the hundredth person who has come here representing himself as the attorney for that new testament, and not one of you has produced it; and no two of you agree as to what it means, or just how your client is to be benefited by it. Now, you get out of here, and do not come back until you can produce the testament."

Of all the preachers I ever asked not one has been able to tell me off-hand what is this new testament, this new will of God, for which he is supposed to be an

attorney. My Christian friend, you who are pretending to live under this new dispensation, do *you* know the words of the new testament? Do you know what is *now* the Will of God? A *new* covenant that was put into effect because the *old* was weak and because the people should not live thereby. If your preachers do not know, and you do not know, how *do* you know that you are getting your rights under the will of God?

Jeremiah and others prophesied the words of this new testament. Christ claimed that the time had arrived to have it enforced, and Paul, repeating its words, said that Christ had sealed it with His blood. I will quote:

This is the covenant: I will put my laws into their mind, and write them in their hearts; and I will be to them a God, and they shall be to me a people. And they shall not teach every man his neighbor, and every man his brother, saying, Know the Lord; for all shall know me from the least to the greatest. For I will be merciful to their unrighteousness, and their sins and their iniquities will I remember no more.

Nowhere else in the Bible is there any language stating anything different from this, as being a new covenant, and I claim that any one who claims to give to the Bible *any* authoritative value is estopped from preaching anything contrary to the wording of this new testament.

When I come as a client of the attorney and ask to be told what are my rights under the new covenant, I am told that in addition to the Mosaic Laws, there are added a lot of Christian Laws and Pauline Laws, all of which are written in some books called the "Books of the New Testament," and all of which I must obey to be saved. And not only must I speak privately to

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my neighbor and brother, saying, "Know God," but must chip in to keep the paid pulpiteer, who will proclaim publicly, saying, "Know God," and to cap the climax I am told, "And if you do not believe this and do this, God will know and remember, and damn you through all eternity." When the attorney tells me that this is the new testament, when any one may see that it is *exactly contrary* to the new testament, should you, my friend, be surprised if I denounce him in language equally as forcible?

I believe the new covenant; therefore, I do not believe the popular preacher. I believe the new covenant, not because it is in the Bible, but because it accords with my idea of the relation of man to the Supreme Being. When this document, purporting to be the latest will of God, is worded so concisely, so wonderfully, so truly, I say that it was conceived by inspiration. Were I able to conceive anything *more* wonderful than this, I would proclaim it as the "Latest Will of God." But the new covenant, as prophesied by the prophets of old, and placed as the central gem in the books surrounding this new testament, seems to be a final document.

God in the mind and heart; all to know God; none to fear God, for our sins are to be remembered no more. What a wonderful conception! How old, and yet how different from what we hear from the pulpit! No written laws to be misinterpreted, to cause contests and divisions, conflicts and wars. No duties imposed to hamper and hinder the aspirations and inspirations, which result from God in the mind. No rewards offered, and still better, no punishments threatened, to deter one that might fear to listen to this "still small voice," which, on account of one's not listening, has seldom been impressive. No wonder the preachers

say this conception was meant for the millennium. But who is to bring about this millennial condition?

I know this is visionary and ideal, but it is the Will of God. We have been living under the law, lo! these many years; we have had our priests and preachers, our guides and teachers, yet, do we "Know God"? Suppose God could appear?—but that is an impossible conception. Suppose Christ could appear and be recognized by each individual? How many would drop in terror of the judgment? "They that live by the law shall be judged by the law." "For, if that first covenant had been faultless, there should no place have been found for the second."

Reader, is it safer to follow a written law or to follow God's aspiration and inspiration in the mind? Which will teach us more of God? Which will quicker mark one as the child of God? And then, when all shall know God from the least to the greatest, that is only the beginning. When men are capable of being guided by the "Holy Spirit of God" (Highest Desire), following the aspirations and inspiration, naturally, without hope of reward or fear of punishment, *then is just the beginning*. Then will man be in a fit condition to do that for which he is manifest on earth—a work which God can do only through man, and man may know how to do only through the direction of God. Then, the Desire revealed to us as aspiration and inspiration, but with a conception more correctly interpreted by an increasing knowledge, will cause us to establish a kingdom of heaven of which Christ and Paul had but a first and faint conception.

Impossible! is the usual exclamation. Yes, impossible, under these innumerable, conflicting laws and contending leaders. And so long as there is no proof

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that one is more nearly right than the other, there is little chance for unity. But when we have liberty to follow Desire and utilize Power, then will we appear supernatural. There are hundreds of organizations, but, from all indications, no person is any nearer to knowing God in one than in another,—at least there is no evidence to that effect. It is a mere matter of belief, which, no matter how it came to be fixed, is well-nigh unchangeable by exterior suasion. But there is a continually increasing number of minds that have independent ideas, and if these ideas are inspirational, and there is but one source of inspiration, and these minds becoming more reasonable, or, with more knowledge, will more correctly interpret these aspirations and inspirations, that will mean a unity of mind. If there were an association of minds on a platform so broad that there would be no conflict, and the organization should produce results that were convincing in their benefits, such a band would aggregate and attract to itself a number who might unconsciously bring about the millennium.

It is generally assumed that there is in every person something that is good. Were such the case, the Highest Desire in such a person must be good, and in any person must be the best incentive to action or the incentive to the best actions. Granting this, could we logically say that there could be a better leadership than the Highest Desire within us? You may say, "Who is to be the judge of what is the Highest Desire?" Who judges now? We are judged by the preacher, priest, and the people. Who made them judges? Are they competent judges? They judge according to their own idea, and they are apt to criticise just as quickly one who has inspirations above their

comprehension as one who has low inclinations; not only as quickly, but with a more severe judgment. The case of Christ and Barabbas continually repeats itself in the history of human judgment.

We recognize in the present stage of civilization the necessity of laws and penalties for the government and organization of man's conduct in the economic and moral bearing to his fellow-man, but there are thousands who care not for the laws and penalties in use for the purpose of regulating their denominational religious conduct.

To the millions who fear the judgment, no matter what the means by which they think they are to be judged, I say, there is only one authoritative leader, the Highest Desire within you, that is God's law written in the mind and heart. I might, in all sincerity, add this supplication: "I beseech you, dearly beloved, to follow this Holy Spirit, for Christ's sake, Amen."

There is a saying, "There is no great loss without some small gain." And I believe there is an equal amount of truth in this: "There is no great gain without some small loss." The feeling of responsibility still attends the feeling of liberty, for liberty always denotes a latitude of license into which each man more or less departs. We may sometimes wish to shun completely this responsibility. What man is there who at some time does not have that same feeling that animated him as a boy and caused him to throw himself into his mother's arms and say, "Oh, mother, I've been so bad, won't you forgive me?" And when his mother fondled him and forgave him with a kindly chiding, what a relief he felt at this responsibility for wrong, as a burden rolled away! Was it *real* relief? As real as anything on earth. And all of us, at some time, echo in our hearts:

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Backward, turn backward, oh, Time, in thy flight,
Make me a child again just for to-night.

Just for to-night, not all the time, but just long enough to get rid of that load of responsibility. Millions have the satisfaction of their imaginary God, to whom they go in prayer. Does it seem cruel or wicked to do anything to destroy this faith in the efficiency of this God? No more cruel than it is for nature to permit a child finally to grow into the stature of a man.

I doubt the existence of a God that can hear prayer. The belief in such a God has been, in the past, a source of great satisfaction, as it is now to millions. And even now, what satisfaction it would be to me to have a God that would forgive all my sins, rectify all my mistakes, and lift the burden and let me start fresh! But I regard that just as impossible as the turning backward of time in his flight.

When I cut my finger, I know it is apt to heal up, but I do not therefore continue to cut it. When I do wrong, it may, in time, be rectified, but there may remain a scar. To one who gets any satisfaction from cutting the finger, or from doing wrong rather than right, I can only say that I believe there is more satisfaction to be gained from the normal than from the abnormal. And the correct condition of the human being is to follow the Highest Desire, which will lead to a physical, mental, and spiritual well-being. A normal condition, with normal surroundings, would be a condition practically free from fear. The happiness to be attained from such a condition is, I believe, only the normal condition of man. Man is not in a normal condition, now, but in a transitory condition, nearer animal than inspirational; influenced more by fear than

by faith. "Now, faith without works is dead." Who is to direct our works?

I am thoroughly impressed with the idea that submissively following human authority (and all exterior authority is human, whatever its origin) accounts for the slow progress of humanity to a higher state of mentality and spirituality. The millions who are following the guide of books or man should realize that there is *no* authority in them, only such as is delegated to them by their followers. The Supreme Being has not delegated the power to any one to lead you or me. I wish that you could be impressed by the idea that if in following these self-appointed leaders, you are not following the Highest Desire within you; or, if by listening to them, you close your perception to aspiration, and inspirations, your responsibility cannot be shifted to those who are your guides. If the blind lead the blind, and they both fall in the ditch, the followers suffer just the same as the leaders.

Refusing to acknowledge any authority superior to the Highest Desire within us does not necessitate our going contrary to all other authority. On the other hand, we will be surprised when following our Highest Desire to realize how thoroughly we are in accord with the best teachings of all sects and denominations.

As I said in the introduction, it is the difference which we magnify that makes our conflicts and troubles. What makes this situation so ludicrous is the fact that these differences are not fundamental, but are differences in opinions and beliefs in the unknown, and many times unknowable things. Let us admit what all sects teach: that man is individually responsible for his choice of right or wrong. Now, let each individual decide what is his Highest Desire, and follow it. Will

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the condition be better or worse than if we each try to force the other to follow some exterior guide which is fully as apt to be misinterpreted as are the aspirations and inspirations within? Organizing under the leadership of the Holy Ghost impressed me twelve or fourteen years ago as such a reasonable solution of our denominational difficulties that I proposed an outline of such an organization. At the time, I was surprised that any one should refuse to join such an association. But now I realize that no matter how good or how true a thing may be, there must be a certain synchronism of opinion to allow a person to be able to accept it. There will sometime be an association of kindred spirits, and whether formally or informally organized, they will become recognized. Did every one who acknowledges no leadership but the Highest Desire claim membership in such an organization, how many would there be? In another place I will give my outline for such an organization.

To succeed, man must necessarily have faith in his aspirations and inspirations, that is, in his interpretation of his Highest Desire. The teaching of most forms of religion is to discredit the Ego; to direct the mind and place the faith on some exterior source of guidance. As I have said before, it is characteristic of the mass of mankind to be subservient to exterior authority. This may have been necessary in the past, and may be for a limited time in the future; but sometime in the future, man will have to discriminate, and, while he may have faith to believe in what another *knows*, he will not have such unmitigated credulity in what another can only *suppose*. Man *must* have faith in something; whether it be in a prophet, priest, or preacher, a book, or a law, or a teacher, or in the personal aspirations and in-

spirations, each has his faith. Whether faith comes by volition, will, or conditions, or is subject to voluntary change, I do not know. However, I am satisfied that faith is an essential part of progress.

CHAPTER XXII

FAITH

FAITH is a wonderful thing. Confidence is sublime even when it is ridiculous. The effect of faith and confidence has no fixed relation to the truth or falsity of the object of faith.

I might define faith as the ability undoubtingly to accept perceptions deduced from suggestions, whether the suggestions are sensual, mental, or inspirational. Faith may be modified by the faculty of reason. Deduction and induction are processes of interpretation which are functions of the brain, but which extend in a less degree to the ganglia, and, by an infinitely reduced degree, to any organized combination of atoms.

When it is admitted that matter is incomprehensible, and that mind is incomprehensible, it is no more absurd to say that matter thinks than to say that mind thinks. But the fixed idea that matter is inert and mind active causes one statement to seem more absurd than the other.

I have said that matter was the manifestation of Power and Desire. The material aspect is of the Power; the mind aspect is of the Desire. These are not simply inseparable; they are one and the same, although the aspects are so different. According to this conception, it would not be consistent to say that mind is the intelli-

gent part of matter. Mind is matter no less than matter is mind. Each term represents an abstraction which we do not comprehend. Matter is materialized, and we are conscious of it on the material plane. We may call that function of the brain which interprets these sensual impressions the objective mind; that is, it is the medium between *object* and *subject*. It is developed by observation and experience.

A suggestion is in no way different from an impression, though we use the latter more frequently as indicating an objective, material source. A mental or an inspirational suggestion *must* be interpreted in sensible terms, *i.e.*, in terms of sense, no less than the objective impressions. We may call the function of the brain which interprets these inspirational suggestions the subjective mind, that is, it is the medium between *spirit* and *subject*.

As I said before, each suggestion or impression, from whatever source, may be *interpreted* to consciousness either inductively by concrete reasoning (objective mind), or deductively by abstract reasoning (subjective mind). I see no reason for thinking that the objective mind and subjective mind are functions of two different entities. The inductive process, taking more time and energy, undoubtedly requires more machinery, and a larger part of the brain dedicated to practical reason may be used especially in that process. We may arrive at the solution of a problem algebraically or arithmetically; the true answer will be the same in either case. If a question be suggested, the true answer would be the same, whether by the process of deduction or induction. That the answers do not always agree shows that the process of interpretation is faulty. Each method has its advantages and disadvantages.

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When the algebraical, deductive method will work, it is quicker, less liable to error, and will give answers to questions incapable of solution by the other method. But as most of us are still ignorant as yet, we must use the more laborious, arithmetical, inductive method, arriving at conclusions by the slow process of concrete reason. If the two processes were by two separate entities, there would be no relation. But the correctness of the perception by the deductive method depends in most cases on the development or ability of the brain to interpret by the inductive method. Were this not so, there would be no necessity for getting learning and developing reason in order to acquire knowledge.

I have rather strained the ordinary use of the term "deduction" in making it cover the idea of intuition. But there could not possibly be a consciousness of an intuition without deduction or induction, for, as stated before, a *single* thing has absolutely no meaning until related to some other thing. And this *relating* is a function of the brain which always acts deductively or inductively, or, it might be said, either philosophically or scientifically.

The more one depends on the inductive power of concrete reason, the less dependence there is on the deductive power of abstract reason. This, by no construction means that the more knowledge, the less faith. The more knowledge, the more there is which we know that we know not, and on gaining perceptions of the unknown, we may be guided in our actions resulting from inspiration and aspiration, either by faith or by reason.

So long as people act by faith alone, there will be many cases of misplaced confidence. So long as people act by reason alone, there will be but little progress. Of

the two, I would prefer faith; of the two, I am prone to act by reason. Scepticism is not pleasant, but it seems necessary.

Faith can have its greatest reward only when founded on truth. What is truth? When we know that we are not walking by faith but by knowledge. Is there no infallible guide to right? No answer to prayer so plain that there is no chance to err? To the average man I would say emphatically, "No," for the average man is not normal. It sounds queer, but you must admit that correctness is the normal state, though it may not be the usual state. Perfect health is the normal physical state, but few enjoy it. To the drunkard or glutton, the appetite is not a correct guide to physical needs. To the moral pervert or fanatic, the conscience is not a correct guide. When the body is normally healthy, appetite is a suitable guide. When the brain is normally healthy, the conscience is a suitable guide. And when body and brain are normally healthy, and one is conscious of an aspiration and an inspiration, then, when there is a contest between faith in the Desire and the reason for not following it, which shall decide? I say (and it really does so in most cases) let Fear decide. This may seem queer to say: when between the Devil (Fear) and the Deep Sea (reason) to allow the Devil to decide. But, remember, in the normal, Force is controlled by Power. Fear is controlled by Desire. Force and Fear are necessary; they have their place and their work. Fear, in the beginning, is used as a signal of danger, and, in a perfectly normal state, might be a safety stop. You avoid the road which you fear the most.

As knowledge gives more reason, and as one gets more faith in the value of inspiration, it might seem that

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the chance of error would be greater, but I conceive the opposite to be the case. For each time the right path is chosen, the chances are less for taking the wrong one the next time. In other words, the more we utilize this deductive part of the faculty of perception, the more nearly correct will be the interpretation of inspiration.

Excuse me for taking so many words to say so little. All this was expressed in a few words two thousand years ago, when Paul said, "But, strong meat belongeth to them of full age, even those who, by reason of use, have their senses exercised to discern both good and evil." I think many moons ago man might have attained to an age when he was ready for meat had he exercised his senses to discern good and evil instead of asking the priest, or looking in the Bible, or going to the Lord in prayer.

When I started this chapter on Faith, I intended to consider it in its physical and mental aspects, but I got into the more important spiritual aspect, and the inspirational or religious aspect may have so many interminable ramifications that I always move in danger of getting far from the original subject.

The effect of faith is not simply conscious perception, or concept of the Ego; it reacts on mind and body (mental and physical conditions). "If thou have faith as a grain of mustard seed, thou mayest say unto this mountain, 'Be removed,' and it would be removed." I have seen a granite rock, weighing many tons, that had been split three feet apart by the faith of a seed. Year after year the towering elm forces farther apart the sides of the immense rock. Suppose one had never seen this or similar results. Given a little seed; in the seed, a desire to gain to full perfection its charac-

teristic form; a cleft in the rock only wide enough to contain the seed; an aspiration to grow; but look at the impossible conditions! Were you conscious of such a position, would you allow faith or reason to decide the possible result? Scientists who have viewed this tree say, "Wonderful, but all from natural forces." So are all results of faith from natural causes, but the point is, to have the faith when you can see no natural cause to bring about the desired result. Comparing the size of the man to the size of the seed, were his faith in the same proportion, what would be the size of the mountain he might remove? Christ concluded the sentence by saying, "and nothing shall be impossible to you." Is it well for me to dispute it?

I have said that conditions limit Desire. I also asked to what extent we may change conditions. In answering this I will say I believe that faith is far more able than reason to change conditions. Faith may fail a million times, but if it succeeds once in accomplishing the apparently unreasonable, it has done more than reason, for reason would not have made the attempt. Of course, I mean the person acting by faith or reason. I will make some practical applications. In medical jurisprudence, I venture to say that more discoveries and results have been derived from the unforeseen termination of experiments than from the facts that were inductively perceived by reason and afterward demonstrated. More cases of an *obscure* nature are treated by faith in the remedies (experiments) than are treated by a knowledge of what correctly applies. In other words, in advancing into the unknown, there is usually more of faith than of reason.

When a subject has been told by the hypnotist that his arm is paralyzed, the arm is paralyzed, To every

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physical test, there is paralysis of the arm. Were the suggestion enforced, the arm would continue in that condition of helplessness and finally shrivel from non-use. This is a physical result following a mental impression. The brain was conditioned so that the reason was restrained, confidence gained, and the suggestion received, not only by the consciousness of the Ego but by the consciousness of the atoms controlling the organ affected. They all believe the suggestion. They have faith that the impression is true. Believing that it is useless to act, they will not, cannot act. Reverse the conditions. Suppose a person's arm to be paralyzed from a shock, and the impression was so permanent as to cause the controlling atoms to refuse to act, and then suppose some person could gain their confidence, and, through restraint of reason, suggest that apparently impossible idea, that the arm *could* move. The belief in the suggestion, and the faith that it could be done, allowed, in the abeyance of reason, the effort to be made and the arm moved. Call it suggestion, hypnotism, mental therapeutics, faith, or a miracle. So far as known, the process is the same.

How most medicines act is not known. In rare instances are they mechanical in their action; in but few instances is the chemical action to be traced and its reaction identified. In most cases, it seems that certain drugs make an impression that is interpreted so as to cause a certain action of the organ affected. These actions are known by empirical means. No cause can be given for the effect. Could the same impression be given mentally, the result would be the same. It is well known that the action and reaction of the mental and physical are pronounced. That the mental atti-

tude has great influence over the physical condition is a phase of faith that is well illustrated by a prominent sect. Where faith can act, it is a most valuable cure. Are there cases where conditions prevent the action of faith? I think so. But I have said that I suffer from a moiety of reason. Faith seems to be essential in the various phenomena called psychic. I have said the perceptions of the Ego were physical, mental, and inspirational, as they originated from the body (physical), brain (mental), or Desire (spiritual). One function of the brain is to interpret the various impressions in sensible terms. The attitude of the mind is according to the method of use. If it is called to interpret music, it is apt to do it better if it has had frequent use for that purpose. If it interprets by reason, it may give a different answer than if it interprets by a fixed rule, or by impulse, or by chance. If there be prejudice, it cannot be just. At present, conditions compel prejudice.

The only difference I am able to give in the phases of faith expressed as confidence, or as credulity, is that one is well placed and the other misplaced. To one person, you may appear as a man of great faith; to another, you may appear as a poor, credulous fool. I had rather be called a poor, credulous fool than to have no faith in anything and no confidence in any one. There is truth, and there is righteousness. Blessed are they who have their faith rightly placed.

I have not answered the question, how far can faith influence conditions; for I do not know. I can say this without fear of dispute, that all the improved conditions for which man hopes will be realized only by faith and works, and if all the faith and works were rightly placed, conditions would change so quickly that it would well be called a miracle. Men do not agree as

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to what is of paramount importance,—economic or moral conditions. I think perfection in one would necessitate perfection in the other. I also think that under the present economic conditions, no one can be morally perfect. From this I infer that, at present, the improvement of economic conditions is of paramount importance. Few doubt that economic conditions might be improved. There are many plans and platforms, but apparently little chance for agreement. It would seem to me that the best chance for an agreement would be on a plan that would meet with the least opposition; a plan that permitted, instead of compelled. In the following chapter I will give an outline of the kind of economic plan that I suggest. In the succeeding chapters, I will enlarge on the present and probable future conditions of man.

CHAPTER XXIII

EQUITY

THE failure to make a success of business is, in most cases, I believe, due more to the economic fallacies of our present business system than to the lack of ability in the individual.

The saying, "competition is the life of trade," is being recognized by the capitalists as an economic fallacy. They are therefore ceasing their competition and are combining their mutual interests.

The reason the mass of the people do not see that co-operation is better than competition is because they believe that each or any one of them has a chance to succeed in business and to secure an income sufficient to support him in his declining years. Now, certainly not more than one fourth of the people succeed by any kind of labor or business in securing an income that will support them without labor. Every person does not have that chance, but some few have it, and each one in his ignorance of the future fondly imagines that by merit or luck he may be one of those who succeed. But state it another way. Seventy-five per cent. of the people will absolutely fail in gaining an independent income, *i.e.*, in being supported in affluence by the labor of others. If a majority of the people realized that they were included in this number, would

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it be imagining too much to think they would formulate a plan whereby the results of labor would have a more equitable distribution?

There is an ethical difference between a profitable exchange and the profit of exchange. The latter, the profit system, the desire to advance by the labor of others, to gain something beyond an exact equivalent, is the basis of our economic laws, and the belief of the majority that they will eventually be among the ones profited continues those laws in effect.

The successful tell how to succeed, but the advice is fallacious, for it is meant for exceptional and not general application. "Never go in debt, but save all you can, putting your money where it will bring interest," is a specimen of the advice. In the first place, if each one saved all he could, there would be a universal disaster to various kinds of industries; and in the second place, if no one went in debt, who would pay interest on the money saved?

Another says, "Invest all you can borrow, so your brains will make it yield a larger profit than the interest you pay." Probably this advice has been followed to a successful issue in more cases than the other, but the number of failures show that something is lacking to make the advice infallible.

The man who invests his money is considered more meritorious than the man who spends his money. Any one who spends his first thousand dollars beyond the necessities of life for any other purpose than to make more money is called a spendthrift and fool. The one who invests it at five per cent. has, in twenty years, two thousand dollars, and in forty years four thousand dollars, three fourths of which he has not produced, but he is spoken of in terms of respect. He is a capital-

ist. They say: "He has made his money earn more money." But this is another fallacious saying, for money cannot earn money.

Our civilization necessitates our production being carried on by accumulated labor in the shape of machinery, manufacturing plants, etc., which we call invested capital, of which money simply represents the exchange value. The capitalist trades on this necessity to obtain a portion of the new production, which he himself had no part in producing.

It is said that the capitalist, the manufacturer, is a public benefactor, that he gives employment to thousands of laborers, but if the capitalist and his millions were annihilated, laborers would continue to produce and live. The manufacturer claims that it is his brains, his management, that makes the capital productive; but the expense account is charged with interest on investment, as well as with the services of the proprietor, if actively engaged, at a salary which equals his brain worth in any other institution, and if the balance sheet does not show a profit in addition to all this, he thinks the business has been a failure.

In most large corporations many of the stockholders have no knowledge of the business whatever. The largest stockholders are frequently officers on liberal salaries, but they seldom conduct the business. There are managers, overseers, engineers, etc., who have the technical knowledge necessary to conduct the business, but they are working for wages because their earlier earnings went toward getting this technical knowledge, and then their later earnings are spent in enjoying, as best they may, this small part of the fruits of their labor.

A few of the animals have the faculty of accumula-

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tion, though none but humans use such accumulations as a means whereby other animals are forced to support them. Certain men have this faculty of accumulation, and conditions cause this accumulation to become necessary to others, thus enabling them to levy an unrighteous, though legal, tax, which is called interest. We also have a system of distribution whereby is extorted the commonly considered legitimate "profit of exchange." In addition to these taxes are the extra expenses, which the competitive method has placed on all industries, but which have ultimately to be borne by the laborer. One object of trust organization is, by escaping these expenses, to lower the cost of production and exchange, but the power which enables the combiners to do this, also makes them able to put this saving in their own pockets, instead of allowing the producer or consumer to have the benefit.

The laborer says, "competition is the life of trade," and wants to "bust the trust," but he does not believe that competition in labor improves the life of the laborer. Not long ago laborers fought against the introduction of labor-saving machinery. It came in competition with them. It threw them out of work. But the fight was useless. Inventions multiplied, and gradually the laborer saw he was benefited thereby. Even if the benefits are unequally divided between the machine and the man, between capital and labor, yet the laborer is better off.

Power saved is equal to so much power discovered. If natural power exists, we think it ought to be utilized, even if it does come in competition with horse-power or man-power, but the laborer does not want all the man-power utilized. He opposes the laborers of other countries. He even antagonizes his fellow-laborers

here. The labor platform proposes to support all convicts in idleness, for fear they will come in competition with other laborers; as logically only one member of a family should be permitted to work for the support of an entire family, in order to prevent the other wage-earners in that family from coming in competition with families containing but one wage-earner.

Another fallacy is the idea that the law of supply and demand is superior to conditions, an immutable law, which man is powerless to modify. This law, now, has nothing in common with the many wants and limited gratification of the mass of the people. It is true that usually the price of the supply is influenced by its ratio to demand, but only those who have money are in a position to demand. A thousand starving families without money cause no fluctuation in the market. Demand is the bear of the market, and supply is the bull of the market, but there is no fixed law by which the price is graded or governed according to any ratio of supply to demand. When the ratio of supply is less, the price is just as high as the bulls can boost it, which is close to the figure which the highest buyer will give. When the ratio of supply is greater than the demand, the price is just as low as the bears can bring it, which is close to the figures for which the lowest supply will sell. There is no fixed schedule of fluctuation, but each side takes every advantage the conditions allow, no matter how foreign they may be to the needs of the people; therefore, the *extremes* of the market are far greater than the actual difference in cost of the supplies would warrant.

Trusts are to some degree able to control and prevent these fluctuations, but the ability of monopolies to buy

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at their own price and sell at a price which they consider profitable, is believed by some people to be a dangerous power, and they wish it destroyed by law, but the law did not confer that power nor can it destroy it, unless it also has the right and power to prevent any two men from going into a partnership.

Experience has demonstrated that trusts cannot be suppressed. Nor do I believe it desirable to go back to the old competitive methods. The trusts are a step in the ultimate, complete co-operation of mankind. If the laborer and producer could adopt their methods, they ought to have the advantage, for capital cannot create labor, while labor is the creator of capital.

The laborer should realize that three fourths of his class has absolutely no chance of living, excepting by their own labor. And that under existing economic conditions they not only support themselves but the other one fourth who live on incomes from capital, and also a large proportion of the actual laborers who are engaged in unproductive labor or work, useless under a co-operative method. If laborers realized this and would co-operate under a plan that would give each one an equitable proportion of the products, it seems plain that they would be better off.

All competition or co-operation should be to benefit the many, not to gain an advantage over the many; yet credit is given to the man who gains an advantage and lives off his fellow-man. A righteous plan would not interfere directly with property rights, nor radically change existing laws, but would enable the laborer to co-operate, and become less dependent on the capitalist.

The essential is to obtain an equitable distribution of the products. The following propositions seem like axioms: (1) Co-operative production and distribution

are essential to our present and future civilization. (2) The greater the proportion of producers, including the necessary distributors, to the total population, the greater may be the production. (3) The greater the production, the greater (ought to be) the wealth and prosperity of the whole people. Probably no one will contradict the first proposition. We may also accept the second proposition, but we are doing all we can to repudiate and nullify it. Instead of trying to increase the number of producers by becoming or remaining one, we are each trying to reach the point where we can have an income: that is, live off the labor of others. The third proposition seems like a logical conclusion from the other two, but it is contradicted by experience. In spite of the idea that the truly great man is he who makes two spears of grass grow where only one grew before, a financial panic would result if he should double the grain crop for two consecutive years. But whom or what could we blame, the great man, a bountiful nature, or our present economic laws of exchange?

It is acknowledged that our present plans of production and exchange are not equitable. Theories have been offered to remedy it, but most of them are too radical or too complex. Co-operation of laborers in communities has accomplished a limited success, but the trials have always lacked the items necessary to a general success. There has usually been an absence of individual right in receipts and expenditures, and the presence of a chance for dishonesty among the leaders; but chiefly a limited co-operation gives no such advantage as is gained by a trust or monopoly.

The following plan of co-operation in distribution is submitted. The enactment of a law would be necessary, but in its simple passage there would be no need of

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radical change of existing laws. The effect would depend wholly on the advantage labor might have under the law, of which these should be the main features:

When a stated number of people shall petition the government, there may be established an exchange in such locality, and with such a manager as may be selected by the petitioners.

The manager shall be provided with sufficient scrip, amply protected from counterfeit, to be given in payment for all products; market price to govern, but modified by an estimate of time and intrinsic value.¹ This scrip shall be redeemable with products through any exchange at a sufficient advance in price to cover running expenses of exchange (*i.e.*, cost of distribution).

In case of foreclosures, bankruptcies, failures, etc., of any firm or corporation in any line of business, the assets shall be turned into the nearest exchange, and the market value of same shall be paid to the creditors in scrip. When one of the larger interests fail, a receiver shall be elected to conduct the business the same as though he were manager of an exchange.

The products of all jails, reformatories, workhouses, penitentiaries, etc., shall be turned into the most convenient exchange, the scrip therefor to be redeemed by the exchange with supplies to be used for the institution, and the surplus to be paid out proportionately to prisoners on the expiration of their sentence.

All real estate placed in charge of an exchange, also

¹ The essential difference between this idea and Owen's "Equitable Bank of Labor Exchange" is that in this exchange "market value" must govern, which would be following the natural law of supply and demand. Owen and Weitling each endeavored to compel exchange on the basis of time cost of production, or "labor value." Many Socialistic theories involve the fallacious idea embraced in this latter plan.

government lands not otherwise used, shall be rented for scrip at a low rate on its estimated value.

Upon application and payment of pro-rata share on actual cost, insurance shall be given against loss by fire, water, wind, or lightning, accident or sickness, and to support actual dependents in case of death or disability of supporter.

The anticipated results of such a plan would be a perfect co-operation of exchange at actual cost of distribution. Such a combination would eliminate the profits of the middlemen. It would tend to make the producer independent of the capitalist. There would be a great saving in the cost of distribution by eliminating advertising expenses, duplicate and excessive stores, superfluous clerks, soliciting agents, drummers, etc., necessary to competition, and the excessive rents occasioned by rivalry for choice location, also a saving on interest, taxes, licence, insurance, salaries, etc. There would be, in fact, all the advantages that the present trusts and monopolies confer without their disadvantages. It would make the laborer a partner instead of a competitor.

Under the present plan, the greater the production, the lower the price, which usually results in a loss instead of a gain; but with an equitable system of exchange the more one produced, the more one would have. There would be a greater incentive to production. Co-operation of producers would naturally follow, not to limit production, as combines do at present, but as a mutual benefit to increase production. Production would not slack until every want was supplied; then more time would be taken to enjoy the benefits until recreation and labor balanced.

There would be less chance for dishonesty. Though

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the scrip would be negotiable, it should not be legal tender as an equivalent for currency, or interest bearing. With the insurance feature there would be no need of hoarding money. It would allow the same individual preference as now in the matter of spending or accumulating. The accumulation either as personal property or as working capital would be beneficial, but it would not give the compelling advantage that it does at present. This plan would not be paternalism. It is simply a method to give producers a chance co-operatively to exchange independently of capitalists. As in the case of other monopolies, it would cause the failure of other institutions, which would under the law become part of the new scheme. It would be but a question of time until all laborers and productive enterprises would be included in this monopoly.

One essential point in this plan is its relation to bankrupts. It would not be unconstitutional or involve the taking of property for public use without rendering due equivalent. The creditor need not force the assignment, but if he should do so, he would have the option of taking the assets, less the commission, as at present; or as a just compensation he would get scrip, which would make the assets equal a like amount of any other commodity, but this would no more be legal tender than the goods assigned. It is not the payment of the debt, for bankruptcy acknowledges the inability to pay the debt.

The bond and stockholders of railroads or of semi-public corporations which might be forced into receivers' hands, or voluntarily placed in the exchange, would be paid according to actual value of residue of property, and it would be run for twenty years at five per cent. additional to actual cost. The property would

then belong to the exchange and become the working capital of the people, under their government. The scrip given in payment thereof would call for commodities from the exchange until it had all been absorbed by producers, and then the original holders of bonds and stock would have to become producers. Labor would cease to pay income to capital. Capitalists would have the return of their principal, but no more, nor are they entitled to more. Though this gives the debtor an equal advantage, it repudiates no moral obligations. It gives the creditor his pound of flesh without permitting him to take the heart's blood. This is one method of obtaining government ownership of public utilities.

Actual government laborers might be permitted to exchange their wages to a limited extent for scrip, and the money thus obtained would pay for the necessary transportation between exchanges until such time as the transportation lines would take scrip or until they became part of the exchange system. Ultimately all government work would be carried on from the commissions deducted as a part of the expense for labor necessary to distribution and exchange. This would eliminate the intermediate profits and much of the expense necessitated by our present system of exchange, taxes, and legal tender.

Instead of having labor and its products both on the supply side, it would put labor on the demand side. At first there would, no doubt, be some discrepancy in quality and quantity of supply to demand, but under more equal liberty to demand, it could not work anything like the inconvenience or irregularity that it does at present. I have seen acres of potatoes lying undug on account of low prices, with farmers lacking

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shoes; and at the same time the shoe factories shut down on account of a glutted market, the laborers idle and wanting potatoes. Nothing as bad or foolish could be possible under the equitable exchange system.

Co-operation of a varied class of producers would be necessary at first to form a complete stock. The cost of production based on time, trouble, and talent, could in a comparatively short time be determined, and a greater equality in price would naturally result. The compensation of the distributors could be arranged in the same way. Shortage on production from unpreventable cause, not covered by other insurance, could be compensated according to the present plan of average when goods are jettisoned. Or by a mutual insurance and sale of futures there would be a purely mutual gain or loss by good or poor crops.

The small per cent. of gain of one line of production over another would hardly influence the supply to such a degree as at present, where competition plays such a disturbing part. One can hardly imagine over-production for some time to come, when one sees how great a want there is at present for the necessities of life; and when these are supplied there is inexhaustible Art, Literature, and Travel to be supplied to those who now hardly dream of such things as possibilities.

When trusts and monopolies shall have closed the channels to individual advancement, and the mass sees that it will be virtually impossible to get into the class, some change will be made. This exchange plan with its results or something equivalent must appeal to all who are not dishonest enough to want to live by the labor of others without giving equitable return.

One great advantage to be gained is, by making the laborer feel assured of a living, to eliminate the constant

fear of being thrown out of work. It does not seem likely that man is created so his life must be given solely to supporting its physical necessities, yet the life of the majority of men is so spent, and is often troubled with fear that even that scant measure of success will not continue. It seems as though the necessities of life should be provided as surely and almost as automatically as the air we breathe, leaving sufficient time to devote to the actual objects of life whenever in the future we may determine what these purposes are.

The Society of Equity, it seems, contemplates bringing about ultimately a condition under which there will be a more equitable distribution.

Equity among men is essential to a perfect manhood, and really we must make some effort to attain to the measure of the Golden Rule before we may expect to receive other inspirations guiding us to a knowledge of the glorious age to come.

Let us co-operate to obtain greater economic freedom in order that we may have more liberty to follow our Highest Desire.

CHAPTER XXIV

LIBERTY

LIBERTY is freedom to follow and utilize a self-enforcing law. Any natural law is a self-enforcing or rather a spontaneously-enforcing law.

The term law has several definitions. I have criticised the use of the phrase, "law of gravitation," as a cause. We know, or suppose we know, what the law of gravitation is, but we do not know what attraction is. Therefore, when we say that bodies fall toward each other "on account of," instead of "according to," the law of gravitation, we assume to know what the cause is.

There is a tendency to use modes of expression which convey the impression that the cause of phenomena is known. The cause of phenomena is unknown except so far as it may be conceived through its manifestation as phenomena. The cause of inspiration is unknown except so far as it may be known through the perceptions of the inspirations.

Law is a description or definition of a mode of motion, action, or conduct. Spontaneous motions and actions are grouped under various definitions and described as natural laws. These laws are usually expressed as statements. Actions and conduct, which are to a greater degree artificial, are grouped under various

definitions and inscribed as statute laws. These laws are usually expressed as commands or commandments. Our perceptions and conceptions of law are usually that it is a command that must be enforced, and action and conduct coerced to comply with the command. Similarly we assume that the natural law is a command given to matter by an external God, whereby its motions are to be coerced (mechanically) in a definite manner. I think we will be nearer correct if we reverse the assumption. Let us assume that according to its Desire, the Power moves in its materialization and acts in its manifestation in such a definite manner that we, by observation and inspiration, are able to describe their motions and actions and express them in statements which we term laws of nature, or natural laws. We may also suppose that the actions and conduct of the higher forms must, to manifest properly the Higher Desire, be definite and bear some specific relation one to another. These limitations we, by observation and inspiration, perceive, describe, and express as commands to be enforced for the good of one and all.

That there is a definite relation between certain parts of Power and their movements (planetary motions) is of comparatively recent discovery. That the natural law, which is supposed to be confined to the physical world, extends into the spiritual world is a recent statement received more as a romance than as a fact.

If the same Desire instigates the various forms of motion, action, and conduct, and if the forms of motion, *i.e.*, natural phenomena, can be grouped and described, and their relation expressed as natural laws, I think it logically follows that the various forms of action and conduct can be grouped and described and their relations expressed as natural laws. On account of their

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manifold complexities, action and conduct are not so definite in their relations as are the motions, but the commands or statutes to which action and conduct are supposed to conform are just and righteous in the proportion to which they conform to the natural laws.

Motion, action, and conduct, I assume, are always to satisfy Desire. Desire, by a co-operation of its various parts, is ever seeking through more complex or higher forms to be gratified with a greater degree of satisfaction. This Desire is the self-enforcing principle in the evolution of form. Self-enforcing does not mean instantaneously-enforcing. If it did, motion, action, and conduct would all be absolutely automatic.

The diversity of individual Desires occasions conflict, and the hindrance which one Desire may occasion another gives a certain latitude to the motions, action, and conduct. This latitude increases according to the complexity of form. A specific action may represent the aggregate latitude of a great aggregate of motions, and the latitude of conduct may represent the aggregate latitude of an aggregate of actions. This latitude I will term license.

License is the freedom to *depart* from a self-enforcing law. Liberty is limited by artificial laws. License is limited by self-enforcing or natural laws.

We admit that Power exists: we assume that it is atomic in its structure: we state that by motion it is manifest. The simplest motion that could be made would be that of two atoms moving toward each other in a straight line. An aggregate of such motions within a given space would be manifest as density; or relating the atoms in one part of the space to the atoms in the other, the relations would be manifest as weight. These motions are manifest only through their resis-

tance to some exterior motion. Resistance is a natural law of the manifestation of motion.

This resistance we may overcome and there will be in this given space less density and less weight. But we have not overcome or annihilated the Power which had been manifest within that space. The decreased density in the given space necessitates an increased density in some other space. The decrease in the relative weight necessitates an increase in some other relative weight. The mass remains the same. We assume that the Power is persistent in its attraction. Persistence of motion is another natural law.

If it is demonstrated that any material has only the attribute of density and weight, we would have to acknowledge that Power could be manifest as a single and separate entity, but I am not aware of any material but what has other attributes. In the chapter on Force I tried to show that material was not solely a manifestation of Power.

If two atoms moving toward each other in a straight line should by a resisting Force be *stopped* in their progress, the motion of the Power being persistent, there is only one possible way in which this motion could exist. That motion is as rotation. If the atoms were *deflected* in their progress, the deflection being persistent would necessitate a motion as revolution. If this motion of rotation or revolution were simply a transformation of the straight line motion, the speed of rotation and revolution could be no greater than the velocity of the lateral motion. In some material there is an energy of motion (insensible and immeasurable, often termed latent, which I assume exists as a motion of rotation and revolution of its atoms) much greater than could be generated by a lateral velocity of the

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mass. Therefore, I assume that this greater energy, or excessive motion of rotation or revolution is due to the energy of the Force.

The resistance and persistence of the energy of these motions is a natural law. Resistance to a certain motion may overcome that specific motion, but it will be thereby transformed into another motion. Force, the cause of motion, is persistent. We have assumed now a Power which is persistent in its motion and a Force which is persistent in its motion. These two entities are manifest to each other through their mutual resistance. The density and weight, manifestations of Power, are overcome in one place and dispersed to another place by the expansive Force. In that other place the excessively large orbit of a revolution is overcome and curtailed by the attractive Power and its peculiar form of motion transformed or dispersed; that is, there is a constant shifting in the relations of Power to Force. Assuming a persistent Power and a persistent Force whose forms of motions are mutually resistant, we have a self-imposed condition which we might think would be extremely chaotic in its manifestation. Saying that the condition is self-imposed does not mean that it is arbitrarily imposed or could be primarily changed. Saying that two and two are four is a self-imposed condition and law of mathematics, does not mean that there is a God of Arithmetic who has made this law and could change it if he wished. There are many who believe the condition of sin and suffering is imposed, or at least permitted, by an Omnipotent God who might in answer to prayer change the conditions if he would. Because God does not change these conditions in answer to prayer many take the advice of Job's wife, "Curse God and die."

Under the assumption that Power and Force are an unintelligent and unconscious energy, physical only, we have no explanation of Being as it is. Under the assumption that there is an exterior psychic will or law that directs the energy, there is an explanation, but the explanation perplexes the intellect of one who is sufficiently developed to comprehend its weakness. Under the assumption that the Power and Force are conscious and intelligent, and are moving in accordance with a Desire which is giving to the motions a form of ever-increasing complexity, and that it is doing this because these higher or complex forms are allowing and enabling the Desire to be gratified with an ever-increasing degree of satisfaction, we have an explanation which seems logical in itself, consistent with facts, and simple as a conception of Being.

That the evolution is not more rapid is because the conditions prevent, but this does not signify that the steps of evolution are equal in length or are taken at equal intervals. Observation shows us that in the culmination of an action the final motions are more rapidly executed than they are in its incipency; also that each successive higher form has been completed in relatively less time. From this I draw the conclusion that the higher complex forms of organization essential to the government of man in his future evolution will be perfected in relatively less time than was necessary for the evolution of any of the present forms of government.

The question arises, can evolution be delayed or expedited? Defining evolution as an ever-increasing complexity of form; and that form is motion, action, and conduct; and that motion is persistent and resistant,—we may conclude that a specific form would be

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expedited or retarded according to whether in its formation it freely followed the Desire or whether it was inhibited by Fear. But there may be more in the issue. It will depend on whether the parties (atoms or man) essential to the forms have liberty to move as impelled by Desire, the self-enforcing law. There must be not only the willingness to move according to the Desire but there must be the energy essential to the motion. If a certain amount of energy is essential to a specific action and this specific amount of energy is used in some other action, it is plain that the specific action cannot be performed at that time: that is, that the evolution will be delayed. Again, if we contemplate a certain action—say, splitting a block of wood—and we try to split it across the grain, we delay the action. If we are compelled to complete the action by cutting across the grain, we have not liberty of action: that is, we are not free to utilize a self-enforcing law.

Desire is always right, the Highest Desire is righteous. While it may be true that "whatever is, is right," it does not follow that whatever is, is righteous. Following the Highest Desire is the natural and shortest road of evolution. As stated before, a certain deviation from the straight and narrow road is allowed, which deviation or latitude we term license. This license is limited by the self-enforcing law of Desire, but to the exact degree to which we take advantage of license just to that degree is the evolution delayed.

Liberty is not only curtailed by the inhibition of Fear, and by artificial laws or compulsions, and by license and the necessities of the lower Desire, but also by ignorance or absence of knowledge of how to utilize the self-enforcing or natural laws. The development of the various parts of Being, as ordinarily manifest,

we term natural growth. If a specific form persists in following a lower Desire or is compelled to refrain from following a higher Desire, we say such a condition is unnatural. Suppose a specific form had liberty and did follow a higher Desire, and had unusual knowledge of how to utilize the self-enforcing or natural laws, it is certain that we should call many of the actions of such a form supernatural. Many of the actions of the civilized man to-day would seem supernatural to the man of three or four centuries ago, just as many of the actions of men during the period of the Inquisition seem unnatural to the men of to-day.

By the terms unnatural or supernatural actions we do not mean actions contrary to or without the natural law, but simply actions that are extremely below or above the ordinary and usual modes of action essential in the development of man.

If these assumptions are true, then in proportion to man's liberty will his actions seem supernatural. Liberty is essential to a rapid development. The development of the various social organizations, religious, political, economic, etc., is to a great degree free from the material conditions which impose the greatest resistance to the development of physical forms. Fear is fast failing as a barrier to our gaining the road to liberty. When we realize that neither the permission of man nor the sanction of Church nor the artificial law can make license equal liberty, or the gratification of a lower Desire equal the gratification of a higher Desire in giving the greatest degree of satisfaction, then we will recognize that the proper function of Fear is to guard the paths that deviate from the highway of liberty to the byways of license.

When we realize that by acting according to our

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aspirations and inspirations, we are forming a conduct whose character is righteous—not essentially because the motives and motions of the conduct are right, but because in its formation we are following a Desire whose gratification will give us the greatest degree of satisfaction—then we will cease to be impressed by the idea that we are “giving up the pleasures of the world” in becoming righteous, but that, on the contrary, we are increasing our capacity for enjoyment. When we realize this, then instead of saying, “the spirit is willing but the flesh is weak,” we may say, “the spirit is strong and the flesh is willing.”

It seems obvious that the artificial or written law, which the more nearly conforms to the natural law, will allow the greater degree of liberty. I will give a few specific examples to illustrate the statement. That form which man may organize to aid him, whether it be a machine, a law, or a society, is best which is the most effective with the least degree of responsibility to the individual; that is, which curtails least the liberties of the man. We see this law enforced through the efforts of inventors to make machines to be to as great a degree as possible automatic, dispensing with the attention of man, relieving him of responsibility and increasing his liberty. That the liberty thus gained may be immediately curtailed by some other condition does not damn the machine or detract from the truth of the statement.

Under the restrictions of partnership law each partner was responsible for all liabilities, on account of which responsibility the business required considerable attention of each person connected therewith. This restriction was eliminated under a form of corporate law which relieved the individual of all but a limited amount

of responsibility and gave him liberty to diversify his investments, also liberty to attend to something else other than the details of a specific business. This law gave a great advantage to capital. It is freely admitted that had it not been for this corporate law, removing the restrictions of the partnership law, the wonderful industrial organizations and the magnificent utility plants would not have developed so rapidly. That the advantages and liberty thus gained may have been curtailed by other conditions is no proper excuse for "busting the trust," or good reason for denying that co-operation is a natural and self-enforcing law of economics.

That the automatic machine originated by man is an aid to his liberty is denied by few. That the monopolistic organization of man is an economic aid and a natural evolution is being more freely admitted. That in spite of these developments the condition of man has not improved proportionately to the machine and organization is also freely admitted. If not, why not? We may agree as to the condition, but as to the remedy there is certainly disagreement. We must have liberty: to have liberty is to be free to follow and utilize a self-enforcing law. We must be free to follow our aspirations and be free to fully utilize all available power in manifesting our inspirations. What hinders us from so doing? Some say, human nature. If this were so, there would not be much hope of rapid improvement, for human nature seems to be much the same the world over, and in the present the same as in the past. Instead of blaming nature for our troubles we would better blame our ignorance and search for the special artificial barrier to our progress.

We will further illustrate by an instance where we

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are not following and utilizing a self-enforcing law. In our system of exchange and distribution we use as a medium of exchange what we term money. Money, according to our present standard, must, in the first place, possess equivalent value; in the second place, be a standard of price, and in the third place, be a medium of exchange. It is acknowledged impossible for any specific thing to possess or successfully fulfil these three conditions at one and the same time. It is like the sides of a triangle. One side cannot be changed without necessitating a change in either one or both the other sides. One angle cannot be changed without destroying the relativeness which previously existed. If the equivalent value changes, as it does when the process of obtaining gold is cheaper, it changes its relation to the standard of price. The fluctuating standard is sure to cause a fluctuation of the quantity of the medium available and always in the opposite direction to that which the situation demands. If two sides of the triangle are fitted to the situation, changing the third side in an endeavor to also make that side fit will immediately upset the other correct relations.

Suppose between two points we have a transportation line with the quantity of vehicles of exchange sufficient to transport a normal traffic. If the traffic increases, the number of cars (which are the medium of the exchange) may not accommodate the traffic, the goods are delayed in the process of exchange, traffic is congested, and business is stagnated. Some shippers may through fear or favor get more than their share of the cars and thus obtain an advantage. Some may get more cars than they can immediately use, but instead of allowing some one else the privilege of using them, they hoard them, for the chance of loss in not getting the

cars when needed offsets the demurrage (interest) paid for keeping the cars on hand. This aggravates the congestion of freight and increases the demand for cars. The shippers begin bidding against each other for the use of the cars, and continue to do so until the cost of the transportation is greater than the supposed profits of exchange. Some, through inability to bid high enough for their cars, are unable to fill their orders or fulfil their obligations. Others, not wishing to fill their orders at a loss, cancel their obligations. Thus, this transportation panic passes through the well-known phases of a financial panic, and in a short time cars are idle, awaiting a business which has ceased to exist.

Is there no way of preventing a periodic occurrence of these troubles? The obvious remedy would be to have an unlimited supply of cars or medium of exchange. This seems impractical in transportation, for cars have an equivalent value. But suppose a new transportation line was organized which could put on cars of practically no equivalent value that would do the work of transportation or exchange just as well. Then, as there would be no question of supply in time of need and no capital invested in cars, there is no question but what the new line would be able to command the business. This may not be immediately applicable to transportation but it may be applied to the methods of exchange. By the use of scrip instead of money of intrinsic value, as suggested in the chapter on Equity, the Exchange would have an advantage that would soon command the business.

The institution of a corporation law did not compel the abandonment of partnership, but under the permission to do business in that way people were impelled

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by self-interest to incorporate their business. The permission to use a scrip of no intrinsic value would relieve people of the responsibility of endeavoring to maintain a triangular form of currency whose angles are constantly shifting, changing the relations of the sides. The equivalent value is fluctuating according to cost of production. Silver was demonetized on this account. As a standard of price, it is shifting according to supply and demand, and locally sometimes doubles or halves within a short time (call loans). As a medium of exchange it varies in its available quantity, varying always the wrong way for the interest of the producers of the products to be exchanged.

The criticism which would be immediately made to the plan of using scrip as a medium of exchange is that, as it has no equivalent value, it could not be a measure of value (standard of price). But it can measure value without being the equivalent of that value. We can measure weight on a spring scale, and we can measure length with a quadrant, neither measure being in any way equivalent to the standard. There is a standard yard; a yardstick may be intrinsically equivalent to the standard, therefore, an accurate measure of a yard, but if yardsticks should be tendered you as a medium of exchange for yards of cloth, you might realize the paradox of our present monetary system.

The unit of our money measure is a dollar and the standard dollar is fixed by law as 25.8 grains of gold, nine-tenths fine. This is supposed to fix its value, making it a "safe and sane" standard. Capitalists say if we have a medium of exchange whose value is *not* fixed, we will have chaos in business. Some Socialists say we can fix something else as a standard of value that will do as well as gold. They are both wrong.

Business does not depend on *fixing* value. Values cannot be *fixed*, and there is no such thing as an *absolute* value which may bear a fixed relation to other things. The endeavor by capitalists or Socialists to have an absolute, fixed standard of value is not following and utilizing a self-enforcing law, because it is contrary to natural law.

Value must be appraised in three distinct ways, which have no fixed relation the one to the others. These various ways exist and no law can prevent their existence or make them bear a fixed relation to a single standard. I will term these various ways of appraising value:

(1) Time Value: the *cost* in time and energy of producing a specific thing (equivalent value).

(2) Intrinsic Value: the *worth* of the specific thing to the user as a source of maintaining life, developing mentality, giving pleasure, increasing spirituality, etc. (use-value).

(3) Market Value: the *price* which a specific thing will bring in the market, which is fixed or fluctuates according to supply and demand (exchange-value).]

No one value can be fixed independent of the other for there is an *inseparable* relation, but not a *fixed* or *definite* relation. A few illustrations may make this idea plain.

Take, for instance, a bushel of wheat. The time value, intrinsic value, and market value might, at a given time, be equal. But suppose that the wheat becomes weevily: the time value remains the same; the intrinsic value decreases, but still may be more than nominal, as it could be used to make starch or feed chickens. But the market value would depend upon whether or not there was a demand for it for any such purpose.

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Take two paintings. The time value may be equal, the intrinsic value of one may be little and of the other very great. Circumstances might be and often are such that the one of least intrinsic value would have the greatest market value.

Take a hat in a milliner's window. We will be credulous enough to assume that the price card fairly represents its time value, intrinsic value, and market value. It is sold, and we will hope that the purchaser got value received. A similar hat is put in its place. It remains unsold. Finally we notice a card: "Your choice of these \$5.00 forms for twenty-five cents." The fashion has changed; the time value and intrinsic value are practically the same, but the market value has disappeared. No matter how credulous one may have been about its stipulated values at first, no one would be credulous enough to believe that any law could be enforced making women give these hats a market value such as they had at first.

Take the old cent that was ploughed up the other day. It did not cost a cent in time, its intrinsic value is doubtful, but its market value is over two hundred dollars. Could the law fix its absolute value, or if it did, should a written law define which of the numismatists should have possession?

But, it may be said, the measure of the value in each case, whether much or little, was in dollars and cents, and without that standard we would be lost in any endeavor to transact business. If there were two standard yards and through process of time it was discovered that one standard was only half that of the other, most people would try to buy by the long standard, and sell by the short standard, and this would occasion more or less confusion. This was the condition

when we had the silver and gold double standard, therefore one of the standards was eliminated. That the people were nearly evenly divided as to which of the standards should be chosen shows that many did not believe that a specified equivalent value of the dollar was essential to transact business. But, it may be said, they agreed that there should be some standard, some absolute value to the real dollar.

How many times have you ever taken the trouble to exchange your currency for real money? How many times have you ever known of its being done solely for the purpose of having the real gold dollar instead of the ideal paper dollar? How many times is it ever done in practical business? So seldom that we might say never. Between nations there is still a certain fetish of fear which compels the balance to be paid in gold, but the gold used is not money. It is not counted or treated as money, but as a commodity. It is weighed, analyzed, and priced at its market or exchange value. "The stamp which makes the dollar good the world over" cuts no figure with another nation nor anywhere else except in financial fiction. The capitalizing stamp can no more *fix* the value of a dollar and prevent the fluctuation of the value of the gold under it, than a Socialistic *ukase* can *fix* the value of a bushel of wheat and prevent its fluctuation.

I think that from the illustrations given (which are only samples of many that might be given, each one differing from the other in some respect) it may be seen that the market or exchange value will fluctuate, and that it is *fixed only* at the time of the exchange by the natural law of supply and demand. The natural law of supply and demand is the only factor which can fix an exchange price. That the natural supply is some-

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times curtailed and the price increased, and that sometimes the supply is increased and the price curtailed; that the natural demand is sometimes unnaturally limited and the price decreased, or that it is sometimes abnormally developed and the price increased, does not affect the statement that the supply and demand are the deciding factors as to the basis of an exchange. Any law which endeavors to fix an arbitrary basis of exchange will curtail our liberty. We can enhance our liberty by in all ways possible becoming free to follow and utilize this self-enforcing law of supply or demand.

I conceive the first step toward this freedom is to make the medium of exchange free. That may be done by allowing those who wish it the privilege of exchanging their labor freely, not troubled by being compelled to use a medium of exchange which has an equivalent value so great that sometimes its interest is more than the profit of exchange, causing the distributor to refuse to trade, congesting business, and paralyzing the producer; but by being allowed to use a scrip of no time value (costing little), though given a protection equal to that given to currency. This scrip would be simply a medium of exchange and a measurer of value. It would have no absolute value and could give no value to the supply. Values are given by the demand. As a measurer of value, or as a medium of exchange, the scrip could not fluctuate, being unlimited in supply. Therefore, the measurer and the medium would have a fixed relation in the scrip, which would be impossible if it also had equivalent value. If trade were relieved of the periodic and local stringency in the money market, then the process of exchange and distribution would continue more

nearly the average and there would not be the inequalities in transportation that there are under the present system.

The currency of our country and even the bonds are supposed to be redeemable in gold, and it is asserted that this redeemability is what maintains its value as money. In times of panic we know that gold is at a premium. Suppose that every one who had currency or matured bonds should at a stated time demand gold? What would be the price of a gold dollar? If the demand was imperative, and it should be satisfied pro rata, one gold dollar might redeem a ten-dollar bill or possibly a one-hundred-dollar bond (I do not know the exact relation), but we all know that the currency of this or any other country is not redeemable in gold *excepting* when the demand does not exceed the supply. It is obvious that this is a self-enforcing law. The producers should be free to follow and utilize this self-enforcing law by having a scrip plentiful enough to represent and redeem anything which may be produced and not be limited to the amount proportionate to the part which it is supposed may actually demand to be redeemed in gold.

Currency redeemable in gold? Why, you cannot even get your own currency from the bank in time of panic, to say nothing of having it redeemed in gold. The reluctance to adopt a scrip of no equivalent value is because the ordinary mind firmly believes that money, to be good, must possess a fixed, redeemable value. They weigh with a pound weight and measure with a yard measure, which are standard and remain intrinsically the same and are bound to remain the same for an infinite period. They buy with a gold dollar that is standard, but this measure of value does not

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remain equivalently and intrinsically the same. It is subject to constant fluctuation. Some authorities say that the value of gold has decreased at least one half during the last ten years, but the price remains the same, for an artificial law says a specific number of grains of gold shall be worth a dollar. Thus we have a standard of price which is itself changing in value. So rapid has been this change that many financiers advise increasing the amount of gold in the standard dollar. It should be plain to any thinking person that there has never been anything that is an unchanging standard of value, which is constantly equivalent to that value, and that it is impossible that there shall be. If a thing is limited in supply, the value increases in some ratio to demand; if the supply is unlimited, it has no estimable value; therefore, a thing possessing time value cannot be an unfluctuating standard of value.

If our present monetary system is contrary to a natural law, then it might be said to be based on an unnatural law, and as such it is more advantageous to an unnatural person. An unnatural person has been defined as one who persists in following a lower Desire, that is, one who is below the average according to the highest standard of development. It is freely admitted by intellectual people that the profit system of exchange, which is essential when the medium of exchange has time value, has a tendency to debase the higher ideas: that is, that man is not free to follow his highest Desire, when, for the protection of himself and family, he is impelled to attempt to profit by an exchange. Man's economic condition is easily susceptible of improvement, if honest, high-minded men will demand their freedom and adopt some plan where they are at liberty to produce freely and exchange their products equitably.

Another step that would make us free to follow and utilize the self-enforcing law of supply and demand is to have a scientific knowledge of the time value and the intrinsic value of at least the staple articles of commerce. Probably the only authorized attempt which has ever been made to get this knowledge was by the Bureau of Mines. This does find intrinsic value of varieties of coal according to the number of heat units evolved, which knowledge it is said has benefited both producer and consumer. I believe, however, it is one of the duties of the present Tariff Commission to gain this information on protected articles. This knowledge would act simply as a balance or governor and give more intelligent reason to our demand. A self-enforcing law will in time impel man to demand that which is of the most worth to him. Then a knowledge of intrinsic values will be useful. Now those who are most able to demand give little thought to intrinsic value. Does the increased expenditure of money by the rich increase their worth as an individual in a like ratio? Aside from absolute maintenance, man's labor must make him worth more; his knowledge must make him worth more; his pleasures must make him worth more, or they are wasted so far as the man or humanity is concerned. That man is worth the most who has attained the greatest degree of liberty; that man is the most worthless who is the most licentious. One man may be intellectually free and physically bound by sin, another man may be physically free from sin and licensed to preach lies. Men crave liberty. Liberty is freedom to follow the highest Desire and utilize Power. "Ye shall know the truth and the truth shall make you free." What is truth? Simply natural law.

CHAPTER XXV

MAN

I SAID in the introduction that my conception of Being embraced ideas regarding man's existence. I did not mean that I had any conception of what the purpose of man's existence embraces. The common conception of the purpose of man's mundane existence is that it is a probation for the purpose of testing his fitness for an eternal celestial existence in personal companionship with the Creator. "Believe on the Lord Jesus Christ and thou shalt be saved." The test of this belief is a conformity to certain Church laws and the doing of a certain amount of work (paying for a substitute will answer) to get others to believe, with the possible ultimate of getting all to believe and be saved. That this was the conception of Christ and Paul I do not believe. That future immortality is no part of the Hebrew religion is plain to many. As they had no inspiration on that point, they were divided in opinion among themselves.

The definition of the term "salvation," as interpreted according to the different religions, will vary. In one it means individual life after death; in another it means an immersing of the individual into the whole; in another, it means the final perfection of man on earth. Salvation, according to these conceptions more or less vague, with sundry variations thereon, forms the

central theme of all religions. The first definition is accepted by many, Christian and Spiritualist. The second definition is accepted by many, Materialists and Buddhists. The third definition is accepted by many, as Elihu, Paul, and myself (it is easy, on paper, to get into good company).

I believe the object of man's existence as a human being is to be matured on this earth, and as soon as man, or a sufficient number of men, is in a condition near enough perfection to permit, the revelation of the object of man's existence will be manifest in some form.

Let us analyze man's present condition. We may view it in five relations: as physical, mental, moral, economic, and spiritual.

Man's physical condition is perfected. To avoid criticism I must define this broad statement. The *genus homo* is as nearly perfect as any other genus. It may be true that the erectile ear muscles, the coccyx, the vermiform appendix, etc., are useless remnants of former conditions and that in the future these may more fully atrophy. But, with the exception of the adaptive development of certain parts of the separate person, there is no proof or even suggestion that the character of the *genus homo* has altered in the geological past, or must alter in the future. We say, therefore, that the physical man is perfected. The physique of the individual is modified by heredity and environment. Each of these in turn depends to a great degree on the economic condition. The term "economic" will be more fully defined later. Here it may be admitted that the man who works too hard on too little nourishment, and the man who works too little with appetite satiated, will physically deteriorate, and there will be more or less tendency to transmit such deterioration to his

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descendants. The present economic condition of civilized people shows its results on the physique. Take a number of persons at random from a civilized community, and an equal number from an aboriginal tribe, where natural opportunities are equally as good, and those of the civilized class will show a greater divergence from the type, and rather more below than above the normal line of physical perfection. This, we say, is the result following the unnatural condition of civilization, and may be remedied by getting back to the "simple life." I wish to interpolate here that I do not believe that getting back is a solution of any imperfection, for, if any former condition had been satisfactory, there would have been no aspirations which would have resulted in changing those conditions. The physical condition, which I, in common with all, admit might be bettered by the simple life, is only one part of the general condition of man.

Man's mental condition is not perfect. By mental condition I mean the condition contingent on brain development. I do not mean that it is essentially imperfect, but that it is in process of development. This development depends, in a great degree (some say entirely) on heredity and environment. And, as I said before, these in turn depend to a great degree on economic conditions. It is a recognized fact that pupils in school cannot develop mentally unless properly nourished, and it is a fact (frequently exaggerated) that the majority of the pampered children of the rich fall below the average requirements of mental development. Take a number of persons at random from any civilized community and an equal number from any aboriginal tribe, and those of the civilized class will show a great divergence from the mental type, but the

divergence is above the normal line, instead of below, as before. As I said that the proper development of the mental condition, as well as a perfect physical condition, depended, to a degree, on economic conditions, and as getting back to the simple life will not, in the ultimate, develop the mental condition, my definition of a proper economic condition cannot be synonymous with the simple life. This synonymy is an orthodox belief with many.

Before defining my idea of a proper economic condition, we must consider man's moral condition. My term "moral" is susceptible of many descriptions. It might, by combining the various definitions, be easy to show that one man was as moral as any other man, or that every man was wholly immoral. Morality may be measured by rules, laws, utility, sympathy, religion, motives, conscience, etc., giving so many standards that, in speaking of man's moral condition, it is possible only to generalize. Let us take an equal number of any race of people, and, judging by their own standard of morals, one race is no way morally different from another. Take an equal number from any of the various religions, and, judging by their standard of morals, one class of believers is no more moral than the other. Take, even, two congregations of the same denomination, say a Methodist congregation in the city and another in the mountains of West Virginia. Their religion and creed are the same, yet the moral standard of the two is different. Theatre-going and bridge would damn one in the country, while feuds and moonshining would equally damn one in the city. While their religion or creed does not sanction these practices in any case, yet the *moral* standard does allow to a degree practices in one place that would not

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be allowed in the other place. But all classes, according to *their own standard*, are equally moral. Take an equal number of the "bloated monopolists," members of the Bar, "Wall Street sharks," East Side merchants, and denizens of the Bowery dives; all these are classed as thieves by some, but extend the classes to embrace the artists of Bohemia, and farmers in a specific community, and the commission men who handle their produce; it is obvious that all these classes are not bound by the same standard of morals, or, as it is usually expressed, "code of ethics."

Designating one phase of morality, honesty, most of us would impulsively say that the farmers were as a class the most honest. "The honest old farmer," is a current expression. But, of a certain number of farmers, what proportion would stand to lose half their fortune by simply a nod of the head or a wave of the hand? Or, to put it more direct, if you had the nod of the head of ten brokers, "on change," confirming a deal which meant the loss of a thousand dollars to each and a gain of a thousand dollars to you from each, and, on the other hand, if you had the unwitnessed word of each of ten farmers, confirming a deal, which maturing before any other security was given, showed a net loss to each of a thousand dollars and a like gain to you, through which source would you expect to come the more nearly getting your ten thousand dollars? In spite of the obvious answer, the broker would not pose as more honest than the farmer. The standard of morals enforced in their business is *different*. Between these two classes, who shall decide which standard is the higher? In all these classes there will be about an equal degree of conformation of the individuals to the standard by which they are governed.

The moral standard is gauged by its bearing financially, socially, and religiously. Nowhere and in no class is there a *recognized standard* of morals. Therefore, instead of saying that people are governed by a standard of morals, it might be more nearly correct to say that the condition of the class to which the individuals belong fixes their kind of moral standard.

Is it not obvious that if we are given the financial, social, and religious condition of the people in a community, or of a specific number of people in any community, we may arrive at a standard of morals to which each individual will so closely conform that we say that he is governed by that standard? Condensing this further, we may say that the condition of a class of people fixes their morals, or man's moral standard is fixed by conditions. This conclusion may be more obvious than enlightening.

So far man's condition has been related as physical and mental, and it has been stated that these conditions depended to a large degree on his economic condition. If morals depend on a condition not defined, the only condition we have mentioned by which it can be defined is the economic condition.

Before going on to consider the economic condition, I will draw another obvious conclusion regarding the moral condition. Let us compare the various standards of morality by which we say the various classes are governed. According to *our* ideas of morality, we say some standards are high and some are low. The purely physical standard, which prevents one from killing another unless he is able, or keeps one from stealing from another, while being watched, seems to be one of the first standards, which, as a condition, we would enforce. The higher physical standard, given

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authority in some of our statute laws, may be too high for some and is certainly too low for others. The mental standards, called utilitarian, or altruistic, are still higher, and takes one into conditions that are as yet ideal, and, therefore, give a standard difficult to follow. This difficulty is well brought out by Tolstoi, who says in *My Religion* (not quoting verbatim but in substance). "I divide my substance with the poor. I have only a crust and a blanket left; here comes a poor beggar with neither. I share with him my crust; I share with him my blanket. I arise in the morning and find the blanket covered with the beggar's vermin. I bid him take the blanket, for, to me, cleanliness is next to godliness. I am naked and hungry, and have naught left but my religion."

Now, viewing the various standards of morals of high and low degree, the obvious conclusion I wish to draw is this: of that class governed by the low standard of morals, a larger proportion will live rather above the standard; while of that class governed by the high standard of morals (including even the "wholly sanctified"), more will fall below the standard than will live above it. This is obvious, not only from observation, but from the fact that the mean is between the extremes. I can imagine many ready to criticise this way of neutralizing man's moral condition, and armed with any number of arguments to show that man's physical, mental, and economic condition are all dependent on man's moral condition. Will such critics claim that man's spiritual condition depends on his moral condition, instead of vice versa? I think not, so let the criticism pass until we have finished.

The position of neutrality which I give morality comes, not only on account of its mean position between

the physical and mental, and the economic and spiritual conditions, but on account of the utter lack of a specific standard of morality. The motive is frequently taken as a measure of morality. I have no doubt that the motives of the Thug and of the Nihilist are as good as yours or mine. But, for all that, we do not like their standard of morals. While we will all agree that *our* standard is the correct one, we will likewise disagree in any attempt to define it.¹

I will go on now to consider the economic condition of man. We said that man's physical condition was perfect, personally modified by his heredity and environment, and influenced by economic conditions. We said that man's mental condition was developing, and, individually, this development was modified by heredity and environment, and influenced by economic conditions. As we said that civilization showed a tendency towards physical deterioration, but a mental development, civilization cannot be synonymous with the best economic condition. I will define economic condition by saying that it is the condition in which and whereby man maintains his being. *That* would then be the best economic condition which would best preserve a perfect physical condition and would best aid the development of the mental condition. And if morality is subject to conditions, or is a condition, that of necessity would also correspond.

So far the definitions and assumptions will hardly be denied, but I do not expect such an agreement with my

¹ According to the Comprehensive Conception, high or low morals simply conform to high or low Desire, and that Desire is Highest whose continued gratification yields the greatest degree of satisfaction. Opinion as to which Desire would lead to the greatest degree of satisfaction would naturally vary according to the development of the comprehension, and conditions may hinder or aid the development.

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description of this condition. One might impulsively say that the man who had the most money was in the best economic condition. This might hold, if financial and economic were synonymous terms. The Hottentot in his tent and the magnate in his mansion are at opposite extremes of the financial scale, but the natural effects of their economic condition may be equally deplorable. When Solomon said, "give me neither poverty nor riches," he seemed to recognize the fact that riches did not perfect condition, though, like the most of us, had we like opportunities, his faith in the assertion was not strong enough to cause him to refuse the riches.

Before describing the best economic condition, I must define my meaning of two words to be used. All that has been produced by man may be divided into two parts called wealth and capital. Any specific kind of thing may be in either class. Wealth is that which represents the necessities and luxuries of life. Capital is that which is used in producing or distributing, or as a source of income. House, clothing, and food we will call necessities; carpets, pictures, and piano we will call luxuries. As a man may rent his house and owe for his piano, he is using another man's capital. So, in speaking of a man's wealth, I will mean only the net part which is free from incumbrances. Capital might be defined as all that which is used as the tools of labor, or as a means of profit, and wealth be defined as the balance. House, clothes, pictures, or education might be either capital or wealth, according to its use. While this use of the words is not without authority, I will admit that it is rather arbitrary, but, as it is for the purpose of defining a condition, such use should be admissible. Having defined the words "wealth" and "capital," I will continue.

The best economic condition is that in which the personal capital is the nearest to the average, and the wealth the greatest above the average, with each increasing.

I will make various applications according to this description and see if it holds good. We will first suppose that all have an average capital. This is practically the state of aboriginal man, where all have to work to an equal degree for a living, and capital is small. This may, in various ways, be brought up to the point where the capital is very large, but, being used in common, the average is maintained and all have to work to an equal degree for a living, although, on account of the increase of capital, each would not have to work so hard and the work would bring greater proportional results. It will hardly be denied that a certain amount of work is necessary for the best physical and mental condition and even the moral condition. Work would be a necessity according to the best economic condition. This does not define whether the work is two hours a day or ten hours a day. Nor, according to the definition, with education (meaning mental or special talent of any kind), classed as capital, would it mean that each should perform an equal amount of manual labor. Nor does it mean that, with the same capital, each would be restricted to the same amount of production. It really means that, so far as production goes (distribution being essential, is understood), *that* is the best economic condition which gives each one the nearest to his equitable share of his production and the *greatest amount of production according to his labor*. This statement is so self-evident that he who contradicts it is self-convicted of selfishness. There is no way of evading the fact that, for each

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amount that one gets above his share, some one or more must have an equivalent amount below. The chapter on Equity showed how capital might be quickly equalized to a certain degree by co-operation of the producers competing with the capitalists. Then, if capital was rendered unproductive from lack of labor, it would quickly exchange for products. That is, go from the hands of capitalists to the hands of producers. The equalization of the opportunity to produce will not, of itself, be the best economic condition. This equalization, and even an equal division of the products, forms the essential feature of many Socialistic proposals to solve the problem. Men are not equal, nor do I believe they ever will be, and, therefore, equality forms no part of my ideal existence. Equity is essential to our highest development but equality is not essential or material.

Under equal opportunity of production (meaning the same as possessing average capital), some would produce more than others; some, by working longer hours, and some by working more skilfully or intelligently. The way in which the products are utilized fixes man's economic condition no less than the ability to produce. Ordinarily, according to the present economic plan, the greater the proportion of the product that is converted into capital, the better financier is such a producer supposed to be. The object of this is supposed to be to obtain a greater income. The income obtained from capital beyond a certain amount is almost invariably at the expense of a part of some other one's share of the product. There are many at present, who are unable to expend their income, even by extravagant means, and this excess is of necessity issued as capital. This inverted pyramiding of capital

must, of mathematical certainty, have its limit. This limit is extended, at present, by increased gold production, increased banking facilities, increased inflation of securities, increased credit, and increased prices. The increased income *must* be taken from the producers' share. Whenever, for any reason, there is inability of the laborer to give his share (scarcity of labor), or there is unwillingness of the income class to accept the products (over production), there is depression, prices are affected, credit shrinks, and securities depreciate. That is, a certain amount of capital ceases to pay income, and that relieves, to some extent, the effect of the inverted pyramiding. A few are able to take advantage of these depressions, but with these few exceptions, every panic has a tendency toward *equalizing* capital. The few who are able to take advantage are those who do not have to sacrifice securities, whose credit is better than that of some other one. Every panic helps to make the rich richer, but not, as many say, "and the poor poorer." It shakes back into the producing class thousands who supposed they were getting into the income class. Were this not so, it would be only a question of time before twenty-five per cent. of the people would be supporting the other seventy-five per cent., instead of seventy-five per cent. supporting the other twenty-five per cent. It is the thousands, yes, millions, and I have no doubt the vast majority who have evolved into the "near rich," on account of their owning some stock, even if it is no more than in a paper gold mine, and who having a taste or an anticipation of a taste of an income, make almost any co-operative plan inoperative, if that plan has a tendency to sacrifice the income dream.

It would conform to the idea of equal capital if, like

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in the good old time, each one raised all he used and used all he raised, but economic civilization has enforced a co-operation. Manufacturing plants and railroad systems are but a co-operative evolution. By enforced monopoly or mutual co-operation, this will necessarily extend through all productive and distributive channels to the economical limit.

The individual *cannot* win in competition with the monopoly. Individual producers must co-operate. Monopolists *cannot* win in competition with co-operative production.

At present, even the best of the laborers, mechanics, artisans, chemists, inventors, etc., are dependent on the capitalist. Co-operative evolution would absorb the best producers, for they will want the best, and there can be no *better* for an honest man than getting his due share of his production. This will gradually leave the capitalist more and more dependent on what is now considered the most dependent class, the weak, the shiftless, the lazy, the degenerate. These, to the degree to which they had less capital than the average, would have to labor for those whose capital was above the average. Economic conditions would gradually eliminate these classes. For the present, we will consider them negligible and continue with the application.

Legal compulsory co-operation cannot succeed any more than legal compulsory competition can succeed. Legal Socialism would be as futile as are the anti-trust laws. Successful co-operation must be spontaneous, but when successful, *economic conditions* will force in the recalcitrant just as they are now forced into the trust. According to a plan similar to that outlined in the chapter on Equity, the bankrupt property placed in the exchange, essentially capitalistic in its nature,

such as factories, railroads, banks, etc., would remain as capital, but bankruptcy is not *legal compulsion*; though its form of receivership is under legal direction. True independence can come only by co-operation. The evolution may be gradual.

Simply equalized capital is not the best condition, but, granting an equal opportunity to the producer, let us see how he might improve his condition. Co-operation means more product with equal labor, or the same product with less labor. Those who retain, for any reason, a disinclination for labor, will produce just sufficient to satisfy, and the latter option, of less labor, will be chosen. Others, who have greater requirements, will labor more and obtain a greater production. What is done with this production will fix, to a degree, the economic condition. The result of one's labor will go, as it does now, according to the personal inclination, but under the differing conditions, there will be different inclinations than at present exist. There would be limitation to the incomes, which limitation, being known, would eliminate the present incentive to "put on," to give the impression of a "near rich," and a "has arrived." Then, there would be no need to put on style to obtain credit, for there would be no credit. "No credit!" I hear the financier howl in derision; "Why, the whole economic fabric of the country is built up on credit; business is maintained by credit."

Now, I do not mind being heterodox in finance any more than I do in science or religion. "Business is maintained by credit," sounds orthodox, does it not? Business is maintained by debts, sounds foolish, does it not? Yet the statements are absolutely alike. Every credit is a debt. But, debts or credits, checks or cash have no influence whatever on the productive ability

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of this country. They simply represent the unequal distribution of capital, and, under a co-operative basis, debtor and creditor would cease to be antagonistic.

To return to the disposition of the products. Some might squander them in riotous living, but that would injure the physical condition, and such a condition would not maintain the best economic condition. The product, aside from the portion essential to an increase of capital, represented by improved machinery, additional distributing facilities, etc., must necessarily go in such a way as to show that man's other conditions are preserved or improved. We do not directly seek to improve our moral condition. We each think we can be more or less moral irrespective of conditions. The physical condition is maintained by a certain amount of work, and refraining from spending the products thereof to the injury of the body. We now have left only the proper development of the mental condition. After absorbing a sufficient quantity of the product as food, clothing, and shelter to sustain the body, and increasing the capital as stated, there should remain a fair portion as net wealth, accumulating in quantity and quality according to individual inclinations. As production would depend (capital and hours of labor being equal) not only on the physical but the mental condition, the wealth would give the necessary material for mental development. Wealth does not mean simply accumulated material, but *worth*. Many a mansion has books and pictures of no *worth* because they are there to give the impression that the owner has a mental condition that is entirely lacking. The books are not read, the pictures are not appreciated, and their position renders them worthless. *That* wealth is of most *worth* which, by its accumulation, tends best

to a development of the mental condition. That which would best develop one brain would not be best for another. A year's travel might be wealth to one; the acquisition of a Stradivarius might be wealth to another. The mental requirements are of such contrasting variety that wealth would have no absolute standard. To set its standard by its use in mental development according to the increased *productive* power would be to capitalize it and, to that extent, degrade it. Many believe there is something essential to the welfare of man aside from the purely utilitarian. I will make no attempt to show the difference. I have made my application in such a way that I hope my meaning is plain, even if it is not accepted. I say that the best economic condition is when capital is nearest the average and wealth the greatest above the average, and each increasing.

I will now consider the spiritual condition of man. The Idealists say that these imperfect conditions are illusions which faithful ignoring will dispel; that Being must of necessity be perfect. Materialists and Monists say that the conditions I have considered are all the real conditions there are; that there is no real spiritual condition; that Being must of necessity be imperfect. Dualists say there is a spiritual condition, but measure it by adherence to Church creed or a spectacular foray against the Devil and his works, or by an ascetic fight against the flesh and the appurtenances thereof, or by a sublime renunciation of the world and all therein. They make psychic religions and spiritual conditions synonymous.

I conceive the spiritual condition of man to be that condition which permits a cognition and interpretation of the Desire of the Ego. The interpretation would of necessity be sensual, and the result of the manifestation would be physical, or mental which could be manifest

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in an objective form. Therefore, the Materialists say they are of physical or mental origin. So obvious is it that there are no purely spiritual results here, that Dualists say the results are to be in the Hereafter.

The best spiritual condition is that in which the individual can best perceive and follow his aspirations; when he can best cognize and most accurately interpret his inspirations; when he can best comprehend and follow his Highest Desire. The best economic condition will give the opportunity for the best spiritual condition. It seems obvious that it gives the best opportunity for following aspirations, but other things so affect the equation that the results would show many exceptions. In the first place, every man would have to be his own judge as to whether or not he was following his Highest Desire in his accepted aspiration. Time would tell whether or not his aspirations were correctly interpreted and executed. It is plain, from my definition of volition, that aspirations and inspirations would be more subject to volition than would be the physical and mental impressions. With inspiration especially subject to volition, and volition subject to no definite cause, it is plain that it would be a mere speculation to definitely co-ordinate the best spiritual condition with the best of the other conditions.

The spiritual, or inspirational, condition of Shakespeare and Poe was good, but, from the records, we would say that their other conditions were not good. If the spiritual condition of Byron and Goethe were good, it is plain that, according to the general standard, it is not synonymous with the moral condition. While the best physical, mental, and economic conditions will not, of necessity, give the best spiritual conditions, yet, to say that the best spiritual condition is independent

of these would be to say that it was through chance that Spinoza was a Caucasian instead of a Tasmanian.

The suggestion of the Highest Desire, which we cognize as being an aspiration and inspiration, is no more like the interpretation which we give it, although the interpretation may be correct, than a pain is like a pin. I believe that all that can be known *a priori* as a fact could be known intuitively, deductively, but it would be a thousand chances to one against any specific intuition being correct, that is, being correctly interpreted. Mathematics would be the least subject to misinterpretation. There have been numerous mathematical prodigies of whom Zera Colburn is the best example. He would answer instantaneously mathematical questions which would require many hours for mathematicians to solve. His solutions were by the deductive method, but when he was educated to use the inductive method, or reason, he lost the ability to interpret by the deductive method. His *mental* condition improved, but his *spiritual* condition failed. It points the contrast in my use of the word spiritual, without casting any reflection, when I say that he then became a Methodist minister.

I have tried to make plain that, according to my conception, evolution is on account of Desire. It is primarily aspirational, inspirational. While I use the words as applying to the Ego, yet it is in no higher sense than atomic desire (except as already defined). Man's mental evolution as manifest in civilization and knowledge is primarily aspirational, inspirational, spiritual. This is applicable to every phase of man's development, secular as well as sacred. It is hard to understand how any one believing in the immanence of God can find a radical difference in the application of these two words, secular and sacred.

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"The idea possesses the man." Intuitions, aspirations, inspirations, Inner Light, Comforter, Holy Ghost, Spirit of Truth, Highest Desire, are all terms expressing the same conception. It seems to me that Highest Desire is the most expressive of what we are to find in the introspective search for a personal guide. It designates the abstract with a definite meaning.

The potter may be as necessary as the painter. A mental failure might have succeeded as a "fiddler on a saw buck." "Now there are diversities of gifts, but the same spirit." "Nay, much more those members of the body, which seem to be more feeble, are necessary." In the twelfth, thirteenth, and fourteenth chapters of I. Corinthians, Paul brings out this subject much more clearly than I could.

But, granting that man may finally reach a condition in all respects nearly perfect; what then? In answer to that, I will say, I do not know. I cannot even conceive. I believe that such a condition is the essential condition of man for the *beginning* of the accomplishment of the object of his mundane existence. It will require some work to get ready to begin. We must be saved first. We must work out our own salvation with fear and trembling, not *in* fear and trembling, but *with* them. When we can get rid of these we are saved.

The economic condition of man is the most concrete of the given conditions. It is the one condition which seems to be under our control. It is the one condition on which, to a greater or less degree, the previously mentioned conditions depend.¹ I have defined the best

¹ It seems that this idea has been fully worked out by Marx and Engels and is now recognized by the phrase "*economic determinism*," first applied to it by Enrico Ferri, *Socialism and Modern Science*, page 163:

"If we leave out of consideration the two unscientific explanations

economic condition. I have vaguely outlined a plan which might aid in bringing about such a condition. But I have admitted that the best spiritual condition would not necessarily follow. As a supplementary aid to the establishment of the best spiritual condition, and in lieu of or in addition to the present denominational organizations, but with an authoritative head higher than any of the churches acknowledge, I submit the following plan; to which plan you are at liberty of pledging yourself without waiting for the consent of any other person or nation on earth.

FEAR NOT
GOD IS LOVE

Certificate and Pledge of ACTIVE Membership in the
Association of Love.

1. Our only Officer, Leader, and Lawgiver in this Association is the Highest Desire within Us.
2. Our Corporate Name is Love.
3. Our Aggressive Motto is, "Perfect love casteth out fear."
4. Our Defensive Motto is "Judge not that ye be not judged."
5. Our Object in Organizing is to Free Ourselves and Others from Fear.
6. Our Result will be Freedom from Fear, which State is Happiness.

Signed_____

of free will and divine providence, we find that two one-sided and therefore incomplete, although correct and scientific, explanations of human history have been given. I refer to the *physical determinism* of Montesquieu, Buckle, and Metchnikoff, and to the *anthropological determinism* of the ethnologists who find the explanation of the events of history in the organic and physical characteristics of the various races of man.

"Karl Marx sums up, combines, and completes these two theories by his *economic determinism*."

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The word happiness as used here has been criticised. If you know of any other word more expressive of man's consciousness of a relatively perfect condition, use it. The condition is of more importance than the word used to typify that condition.

There has never been any need to fear God. Many men are recognizing this fact. The fear of the Devil is needless so long as we obey the law and preserve our liberty. The fear of man is an actual condition. But this fear we may escape at some time more or less remote, through concerted efforts similar to The Society of Equity and The Association of Love.

The last enemy to be conquered is Death. Then, may we say, "O death, where is thy sting, O grave, where is thy victory?" This cannot be logically interpreted as an escape from spiritual death or annihilation. It means just what it says, that "this mortal *must* put on immortality." It is an entirely different conception from that expressed by "we shall shuffle off this mortal coil." Death comes. Many think it is a necessary occurrence within a duly appointed time. There is no agreement by scientists as to why it is necessary in the case of man. Numbers of the infusoria, several of the tree family, and probably the tortoise or turtle die through accidental causes only. So far as known every cause of death of man is theoretically preventable, even those causes which are usually lumped under the head of "old age." The practical application to meet all the emergencies of any individual case may be exceedingly complex, though I am under the impression that, in the evolution of medicine and suggestive therapeutics, the final solution will be relatively simple.

By a mental suggestion, we may cause certain glands

to secrete saliva. Under the proper suggestion, properly given, any gland in the body would secrete or inhibit a secretion. The secretion of a proper opsonin by suggestion would seem more simple as well as more practical than causing the secretion by the injection of dead germs as they do at present; and the prevention of toxin would seem logically better than injecting anti-toxin. However, we had to crawl before we could walk, and there was quite a spell of walking before we could fly.

In psychology as well as hygiene a correct diagnosis of the trouble is the essential point, and in fact the longest step toward a remedy. While I do not say that freedom from Fear will insure immortality, I believe it will constitute an important and essential feature. And when I say that I believe that freedom from Fear can come only through perfect Love, and that God is Love, why should the orthodox "damn" my heterodoxy? My only defence is, "Judge not that ye be not judged."

CHAPTER XXVI

ONTOLOGY

IN speaking of the immortality of man, I do not mean to convey the idea that this human form would continue to all eternity, but even at that, I would prefer the human form to the angelic, with the incumbrance of two wings and a harp. My family history shows that I never was an angel—I am sure I have never wanted to be one, and my Christian friends are equally sure that I never will be one.

I can be no more definite in my limitation of immortality than I was in my limitation of time. Some limit it to the Millennium (a thousand years, I think, is the figure). I do not believe that any limit is fixed for the duration of life.

There is a common saying that "man proposes, but God disposes." I think this is transposed; it should be, "God proposes, but man disposes." If we should follow the Highest Desire; if we should live according to the Will of God; if we should obey the laws of nature (you may take your choice of the statements, they mean the same thing), you will acknowledge that our condition would be better. God is disposed to do well by us, but we do not have the disposition to follow His law written in the mind and heart. "In vain do ye worship Him, for ye accept for doctrine the commandments of

men." Without fixing a limit to immortality (which state has yet to be attained), I am satisfied that where there is a beginning, there is an ending. I have not made even an effort to conceive a thing with only one end. This is as applicable to the angelic state (should there be such a state) as to the human state.

Of the transcendental ideas relating to man, the first in sequence would be that of a beginning. I have said that the Ego is eternal, having neither beginning nor end. Kant has shown rather conclusively that this idea (eternity), as well as the idea of individuality (simplicity), and volition (liberty), and intelligent desire (design), as a thesis or antithesis, may be proved or disproved according to his accepted rules of logic. But he admitted that, while not warranted by Pure Reason, yet, to satisfy the mind, the thesis must be *believed*.

The mental development of man on the deductive side reached its high tide during the time of the Scholastics. The Scholastic philosophy was naturally antecedent to the philosophy of Hume and Kant. Deductive philosophy, ungoverned by the inductive, is erratic. Hume and Kant, by Pure Reason, put an everlasting limit to the erraticism of the Scholastic schisms. The Baconian inductive method had already begun to be effective. Knowledge was building on a sure foundation. So thoroughly were the deductive methods discredited that many denied that such methods were, or could be, of any effect. So far to the other extreme have the Materialists gone that they do not agree with Kant's arbitrary admission of the thesis, but, with a greater degree of dogmatism, insist that anything but the antithesis is an insult to the mind. I think the high tide of Materialism has been reached. The

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scientific publications of the present century show theories that are much more nearly akin to deductions than to inductions. Philo says, "Inspiration comes ahead of demonstration." I believe that the scientists of the future will not be ashamed to acknowledge that the deductive function of the brain is as valuable as the inductive; that inspiration really preceded reason, and that a progress where each is balanced, and developed, will be greater than by either alone.

Let us see if an agreement in the thesis and anti-thesis of the transcendental idea is necessary to co-operation in following the Highest Desire.

(1) Was there no beginning (eternity)? We will all probably admit that every *form* had a beginning, and will in all probability have an ending; or at least we are bound to admit that every form is changing and the time of a complete change is the measure of the duration of that form. This admission would cover every form from a molecule to a universe, and is certainly all the agreement that is necessary. In fact, anything more definite would be unprofitable.

(2) Is there an individual (Ego)? Is there an indivisible atom (electron—simplicity)? We can agree that, so far as we are concerned, there is, and always will be, an ultimately indivisible. I may call this psychically, the Ego; physically, the atom. You may call it psychically, the soul; physically, the corpuscle or electron. Psychically or physically they can be no different, for, in admitting the individuality, we deny the essence (essential *parts*). Also, I think, we will be forced to agree that whatever names are eventually found to *best* aid the logical conception of Being, will receive authoritative (popular) sanction.

(3) Is there such a thing as volition (liberty)?

I think we will agree in this; that Fatalists and Determinists who disbelieve it, and various others through all degrees to and including the Dualists who believe that every motion or thought is subject to volition, all perform their acts entirely uninfluenced by such belief or unbelief. Therefore, the admission or denial of volition will make absolutely no difference in our progress. But Materialists and Monists have no right to deny the existence of volition and then criticise my right to affirm its existence. My right to affirm is based on as pure reason as their right to deny. If they will say that they do not know whether it exists or not, I will say the same. So we either agree or disagree to disagree, and the argument is ended without making any difference.

(4) Is there an intelligent Desire (Designer)? We may agree that atoms *act* as though they were conscious. They respond accurately to impulse. There is a periodicity of their arrangement (atomic weight) and of their motion (octave of sound and spectrum of light). We may admit that nature would give the impression of being designed. To me it seems more plausible to think that nature manifests the Designer by a spontaneous response of its atoms to a conscious Desire, which varied Desire appears as Design, than to think that the atoms move mechanically according to an unconscious law, and these automatically result in nature; or to think that they are moved by mechanical means by an exterior, objective Designer. When I assume the existence of a conscious Desire (Designer), no Materialist who *denies* its existence has a right to criticise my affirmation, for my dogma is based on as pure reason as his. If he says he does not know whether One exists or not, I will reluctantly agree that I do

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not know, but I will immediately affirm that my *belief* in such an Intelligent Desire is so firmly fixed that the denials of others, no matter how great the majority, would not change that *belief*.

My *conception* of God may have changed since youth, but it is still a *belief*, and I feel with Job, "though he slay me, yet will I trust in him." But, whatever we affirm as the nature of the Highest Desire, we must admit that, of the Desires of which we are conscious, one is the Highest, and that when there is apparent conflict, the Highest would be the best one to follow. Unless there is Design in this Desire, I see no reason why following the right is preferable to following the wrong. Aiding the Designer is following the Desire; is doing the Will of God; is conforming to the law of nature.

One other idea, that is not so much transcendental as metaphysical, is the conception of the two antithetical entities, Power and Force. This special idea I supposed to be unique. Of course, there are Spirit and Material; God and Devil; Matter and Motion; but none of these combinations were expressive of enough, and nowhere is there an attempt to make them, in a logical way, include all. Even if there were one word embracing the idea of Power and Desire, and another word embracing the idea of Force and Fear, the new words would find less use than these which express the physical and psychical aspects.

I said I supposed the conception comprising the whole universe in the two entities to be unique, but on reading Poe's philosophical work, *Eureka*,¹ I found that he had

¹ [Published as "Eureka: A Prose Poem," Geo. P. Putnam, New York, 1848, and dedicated to Alexander von Humboldt.]

[To the few who love me and whom I love—to those who feel rather than to those who think—to the dreamers and those who put faith in

the same idea. He uses similar words (Attraction and Repulsion). It is true that he reverses them, saying Repulsion and Attraction; conceiving Force, the unseen as the more spiritual, and Power, the material, as the baser part; Force, the supernatural, and Power, the natural. That this idea, elaborated in the longest of Poe's works and embellished with his ability, should have apparently sunk into oblivion augurs poorly for the acceptance of my independent idea. Unless perchance his prophesy shall come true that, "It will rise again to the Life Everlasting."

We may admit the existence of the Absolute; acknowledge that it is unsearchable; agree that it is unknowable; and yet consistently claim that the *conception* of its Being may be simple. The statement, that, "all is God, which is perfect, and all else is illusion," seems simple, but when we observe that the most we perceive is imperfect, we think the statement should be, "all is Illusion but god." It is much easier to ignore the little "god" than the prominent illusion. Those who say that all is mind ignore the complexity of phenomena. Those who have deduced, and the many who have adopted, the statement, "all is electricity," admit that the positive and negative charges are not the same, nor is it affirmed that they are interchangeable.

dreams as in the only realities—I offer this Book of Truths, not in its character of Truth-Teller, but for the Beauty that abounds in its Truth; constituting it true. To these I present the composition as an Art-Product alone:—let us say as a Romance; or, if I be not urging too lofty a claim, as a Poem.

What I here propound is true:—therefore it cannot die:—or if by any means it be now trodden down so that it die, it will "rise again to the Life Everlasting."

Nevertheless it is as a Poem only that I wish this work to be judged after I am dead.]

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I have used the term Dualists, for that is an authoritative name designating those who believe in a Creator separate from the creature, but the name is not comprehensive enough, for practically all Dualists believe also in a personage (Devil) with the ability to conduct a successful rebellion against the Creator, corrupt the creatures, and attempt to bribe the Creator's Son to join his side. Such ideas are comprehensible, but to take them as comprehensible and try to correlate them with other facts of Being, makes what to me at least is an impossible conception.

The Monists are Idealistic Materialists.—I have been called that myself as well as all other words expressive of heterodoxy. The Materialists are practical Monists. The Monists insist on one entity. It is true that my admission that Force is never manifest (physically) except as motion is nearly equivalent to saying that there is only matter and motion. To many this is the more simple conception, and it presents fully as great possibilities, but, to me, it seems rather inert. While I admit that matter in motion is all there is, yet, when I see the motions vary while the co-relative mass does not vary, I cannot help but conceive a separableness which demolishes absolute Monism. If a specific amount of motion is separable from a specific amount of matter (and, apparently, they may be separated), which is the cause? Is it matter in motion or motion in matter?

The words Power and Force have an expression of virility. It seems easy to conceive of Power and Force, the two universal entities, as being conscious. But it requires an effort (which I am not surprised the Monists do not make), to conceive that motion and matter are conscious. When we say that Power is manifest as matter, and Force is manifest as motion, and that these

are materialized and become objectively perceptible to us through energy, and subjectively perceptible to us as Desire and Fear, we have a logical sequence and a consistency of expression. This seems to me a simple yet comprehensive conception.

While this conception is my religion, because it embraces my relation to the Supreme Being, yet I do not advance any idea as a new religion. I make no statement as having any authoritative weight. If my conception appeals to any one, or aids any one in an independent conception, I shall be pleased.

Equity, or the immediate improvement of the economic condition of man, is a practical subject which should appeal to all. Some things have been tried and failed. Let us try something else. Continued failures may bring the necessary experience for success. Eugenics, or some other method of man's future development, may become more practical as the ideal future seems attainable. If the energy used, and practically wasted in preparing for the hereafter, could be utilized in improving the here, wonders might be accomplished. Ontology, or the study of Being as a whole, may not appeal to many, but, to the thinkers of the age, the solution of its problems must appeal. Chemical action, planetary motion, psychic phenomena, and all other phenomena are related within the scope of man's conception.

Is it worth while to endeavor to obtain a correct conception of Being?

Physicists of the past century have accumulated a wonderful aggregate of facts, many of them related, some left unrelated logically because they cannot be related mechanically. Materialists insist that they conceive of Being only as phenomena. Idealists say the

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phenomena are changeable, fleeting, cannot be eternal, and therefore, are of far less importance than the noumena. Each looks at one side of the shield only. There are two sides. The practical side is the one to which we, as human beings, belong. Practically Being is all phenomena. Every sensation is based on phenomena, and every action must be expressed as phenomena. Yet our reason is not satisfied alone with phenomena. Materialists say it is all we can *know*. True, but knowledge is not built on facts alone, but on the correlation of facts. "Man cannot live on bread alone, but by the word of God." To *conceive* of Being means to go beyond what we *know* of Being. What we know has advanced civilization, but I doubt if to any individual the knowledge has been any more satisfactory than the acquisition of the knowledge, nor, if we can take Spinoza's word, was the result any more profitable than the pursuit.

In any comprehensive conception of Being, the noumena is as essential as the phenomena. Power and Force are the noumena; material and energy the phenomena. Power and Force, alias a thousand other names, afford great scope for the Idealistic romancer. Confined to the noumena it is essentially a romance, for it cannot be known as a fact. When one aims to philosophize with these abstracts alone, the logical entanglements are many and but few have met with much success. It is doubtful if Gautama has ever been surpassed. When one aims at a synthetic philosophy relating the noumena to the phenomena in a logical consistent way, it is building with little precedent. This may be an advantage. It is much easier than the more complex pursuits—just have a few ideas and a few facts; then patch them together logically and con-

sistently. This is what I have aimed at in this book. I do not know that I have even hit the target. I have shot my independent ideas in that direction, and it is some fun shooting, anyhow. When others have aimed and shot (I am deeply convinced it is worth gunning for), we may, in time, get some one to write a standard of synthetic philosophy, a Critique equal to Kant. I might, by dogmatism, have caused some to believe in my ideas, but I much prefer that these ideas should suggest to some one a line of thought that will lead to good, or that some one may be persuaded to search for an inspiration and be filled with the Holy Spirit.

One criticism that may be made of the book is that it is superficial. How could a conception of Being expressed in four hundred pages be otherwise than superficial? I have expressly avoided taking up any phase of Being except such as seemed essential to show my conception to be consistent with phenomena. I also try to show it to be consistent with other conceptions.

I say there is nothing but what is or may be manifest in the materialization of Power and Force. This is Materialism.

I say there is nothing but what is or may be a manifestation of Desire limited by Fear. This is Idealism.

I say there is no form but what is or may be created by Power and Desire (God and Holy Spirit), limited by Force (Devil), and that these forms are the creatures. This is Dualism.

I say there is nothing materialized but what is the result of spontaneous movement of the atoms which are identical in their essence (essentially alike). This is Monism.

There are in these statements no meaningless words used, and no quibbling or unequivocal language, yet,

